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OFFICERS FOR 1887.

President.

JAMES GEDDES, - - - - - - - - - - - Onondaga.

Vice-Presidents.

First District, - - - - - - - JAMES WOOD, New York.
Second District, - - - - - - JOSEPH H. STORM, Dutchess.
Third District, - - - - - - - JARED VAN WAGENEN, Schoharie.
Fourth District, - - - - - - G. H. F. VAN HORNE, Montgomery.
Fifth District, - - - - - - - W. JUDSON SMITH, Onondaga.
Sixth District, - - - - - - JOSEPH JULIAND, Chenango.
Seventh District, - - - - - - W. A. WADSWORTH, Livingston.
Eighth District, - - - - - - HEZEKIAH BOWEN, Orleans.

Corresponding Secretary.

JABEZ S. WOODWARD, - - - - - - - - - - Niagara.

Recording Secretary.

WILLIAM H. BOGART, - - - - - - - - - - - Cayuga.

Treasurer.

ADIN THAYER, - - - - - - - - - - - - Rensselaer.

Executive Committee.

DAVIS COSSITT, - - - - - - - - - - - - Onondaga.
GERRIT S. MILLER, - - - - - - - - - - Madison.
C. C. B. WALKER, - - - - - - - - - - - Steuben.
W. P. RICHARDSON, - - - - - - - - - - Orange.
THOMAS R. PROCTOR, - - - - - - - - - Oneida.
F. O. CHAMBERLAIN, - - - - - - - - - - Ontario.
OSCAR J. LEWIS, - - - - - - - - - - - Rensselaer.
F. B. REDFIELD, - - - - - - - - - - - - Genesee.

Ex-Presidents.

JOHN D. WING, - - - - - - - - - - - - New York.
GEORGE F. MILLS, - - - - - - - - - - - Montgomery.
WILLIAM M. WHITE, - - - - - - - - - - Livingston.
JAMES W. WADSWORTH, - - - - - - - - - Livingston.
JAMES MCCANN, - - - - - - - - - - - Chemung.

Consulting Veterinarian.

Prof. JAMES LAW, F. R. C. V. S., - - - - - - Cornell Univ.

State Agricultural Rooms.

The office of the society is in Agricultural Hall, corner of State and Lodge streets, Albany.

CONSTITUTION.

The style of this society shall be "The New York State Agricultural Society." Its object shall be to improve the condition of agriculture, horticulture and the household arts.

SECTION 1. The society shall consist of such citizens of the State as shall signify in writing their wish to become members, and shall pay, on subscribing, not less than one dollar, and annually thereafter one dollar; and also of honorary and corresponding members. The presidents of county agricultural societies, or a delegate from each, shall, *ex officio*, be members of this society. The payment of ten dollars, or more, shall constitute a member for life, and shall exempt the donor from annual contributions.

SEC. 2. The officers of the society shall consist of a president, eight vice-presidents, one to be located in each judicial district, a recording secretary, a corresponding secretary, a treasurer, an executive committee, to consist of the officers above named, and eight additional members; and five of the ex-presidents shall be, *ex officio*, members of the executive committee, and these five shall consist of the five ex-presidents whose term of office has last expired, of whom three shall constitute a quorum; and that the ex-presidents of the society, not members of the executive committee, shall constitute a board of counselors, to whom may be referred, for consultation and advice, all questions that may from time to time arise, and in the decision of which the society may in any manner be interested; and a general committee, the members of which shall be located in the several counties, and be equal to the representatives in the House of Assembly.

SEC. 3. The recording secretary shall keep the minutes of the society. The corresponding secretary shall carry on the correspondence with other societies, with individuals, and with the general committee, in the furtherance of the objects of the society. The treasurer shall keep the funds of the society, and disburse them on the order of the president or a vice-president, countersigned by the recording secretary, and shall make a report of the receipts and expenditures, at the annual meeting in January. The executive committee shall take charge of and distribute or preserve all seeds, plants, books, models, etc., which may be transmitted to the society; and shall have also the charge of all communications designated

or calculated for publication, and, so far as they may deem expedient, shall collect, arrange and publish the same in such manner and form as they shall deem best calculated to promote the objects of the society. The general committee are charged with the interests of the society in the counties in which they shall respectively reside, and will constitute a medium of communication between the executive committee and the remote members of the society.

SEC. 4. There shall be an annual meeting of the society on the Wednesday after the third Tuesday in January, in the city of Albany, at which time all the officers shall be elected by a plurality of votes, and by ballot, with the exception of the general committee for the counties, which may be appointed by the executive committee, who shall have power to fill any vacancies which may occur in the offices of the society during the year. Extra meetings may be convoked by the executive committee. Fifteen members shall be a quorum for the transaction of business. No person shall be qualified to vote at any election of officers of the society, unless he shall have been a member of the society for at least thirty days prior to such election.

SEC. 5. The society shall hold an annual cattle show and fair at such time and place as shall be designated by the executive committee.

SEC. 6. The constitution may be amended by vote of two-thirds of the members attending any annual meeting, upon one year's previous notice in writing.

EX-PRESIDENTS, AND THE PLACES OF THE FAIRS.

Year.	Name.	Place of fair.
1841..	Joel B. Nott*	Syracuse.
1842..	James S. Wadsworth*	Albany.
1843..	James S. Wadsworth*	Rochester.
1844..	John P. Beekman*	Poughkeepsie.
1845..	Benjamin P. Johnson*	Utica.
1846..	John M. Sherwood*	Auburn.
1847..	George Vail*	Saratoga.
1848..	Lewis F. Allen	Buffalo.
1849..	John A. King*	Syracuse.
1850..	Ezra P. Prentice*	Albany.
1851..	John Delafield *	Rochester.
1852..	Henry Wager *	Utica.
1853..	Lewis G. Morris	Saratoga.
1854..	William Kelly*	New York.
1855..	Samuel Cheever*	Elmira.
1856..	Theodore S. Faxton*	Watertown.
1857..	Alonzo S. Upham*	Buffalo.
1858..	William T. McCoun*	Syracuse.
1859..	Abraham B. Conger*	Albany.
1860..	Benjamin N. Huntington*	Elmira.
1861..	George Geddes*	Watertown.
1862..	Ezra Cornell*	Rochester.
1863..	Edward G. Faile*	Utica.
1864..	James O. Sheldon	Rochester.
1865..	Theodore C. Peters*	Utica.
1866..	John Stanton Gould*	Saratoga.
1867..	Marsena R. Patrick	Buffalo.
1868..	Thomas Hall Faile*	Rochester.
1869..	Samuel Campbell*	Elmira.
1870..	Solon D. Hungerford*	Utica.
1871..	Richard Church	Albany.
1872..	Milo Ingalsbe	Elmira.
1873..	Benjamin F. Angel	Albany.
1874..	Harris Lewis*	Rochester.
1875..	Alexander S. Diven	Elmira.
1876..	Edwin Thorne	Albany.
1877..	Patrick Barry	Rochester.
1878..	George W. Hoffman	Elmira.
1879..	Horatio Seymour*	Utica.
1880..	N. Martin Curtis	Albany.
1881..	Robert J. Swan	Elmira.
1882..	John D. Wing	Utica.
1883..	George F. Mills	Rochester.
1884..	Wm. M. White	Elmira.
1885..	James W. Wadsworth	Albany.
1886..	James McCann	Utica.

* Deceased.

HONORARY AND CORRESPONDING MEMBERS.

Ackland, Sir Thomas Dyke, Bart., London.
Ackland, Thomas Dyke, Jr., London.
Airoles, Liron, Nantes.
Boileau, Sir John P., Bart., London.
Bodisco, Alexander, St. Petersburg.
Barrall, M. J. A., Paris.
Bixio, Alexander, M. D., Paris.
Belanger, C. H., Martinique.
Borg, Louis, Paris.
Cowden, Joseph, Glasgow.
Chevreil, M., Paris.
Campbell, Alexander, Martinique.
Cameron, Charles A., M. D., Dublin.
Delagorde, M., Paris.
Davy, John Tanner, England.
Debouis, Dr., Paris.
Edwards, Milne, Paris.
Fergusson, Adam, Canada.
Fararo, Dr. Jose Tell, Brazil.
Friedlander, Dr. A., St. Petersburg.
Falkersabouf, Prof. Loon, St. Petersburg.
Foote, Elisha, Washington.
Gasparin, M., Paris.
Gourcy, Comte de, Paris.
Gluck, Dr. Isidor, Vienna.
Goessman, Dr. Charles A., Amherst, Mass.
Hannam, John, London.
Hudson, James, London.
Hergien, Dr., Paris.
Howard, Sanford, Lansing, Mich.
Hoffman, John T., New York.
Ignatz, Zickerman, Asszonyrecs, Hungary.
Imre, Count Miko, Transylvania.
Johnson, Cuthbert W., London.
Johnston, James F. W., Durham, England.
Kergolay, Comte de, Paris.
Lawrence, Abbott, Boston.
Latour, Major L. A. Huguet, Montreal.
Laszlo, Korismics, Pesth.
Learmonth, Thomas, Victoria.
Le Couteur, Colonel John, Jersey.
Morris, Margaretta, Pennsylvania.
Maxwell, John Hall, Edinburgh.
Melville, G., Paris.
Mertens d'Ostens, Baron, Belgium.
Miklos, Pataky, Transylvania.
Mano, Sickerman, Kotoj, Hungary.
Moritz, Glück, Goritz, Hungary.
Mornay, Mauny de, Paris.
Montholon, Marquis Charles de, Paris.
Norton, John P., New Haven, Conn.
Nottbeck, Baron J. de, St. Petersburg.
Payen, A., Paris.
Pusey, Philip, England.
Pierce, Benjamin, Cambridge, Mass.
Potter, E. R., Kingston, R. I.
Robinet, M., Paris.
Roehn, Eugene, Paris.
Ruffin, Edward, Richmond, Va.
Shaw, William, London.
Simmonds, P. L., London.
Skinner, J. S., Philadelphia.
Sturge, William, Bristol.
Strafford, Henry, London.
Takall, Sickerman, Kotoj.
Toysef, Havas, Pesth.
Vaillant, Marshal, Paris.
Vilmorin, Louis, Paris.
Whitney, Henry, New Haven, Conn.
Wilder, Marcus P., Boston, Mass.
Wilson, Prof. John, Edinburgh.
Weiss, Dr. Adolph, Vienna.
Waterman, Henry, Hudson, N. Y.
Zimerman, ——, Mad., Hungary.

LIFE MEMBERS.*

*From 1841 to 1887. The names of members whose deaths have been notified to the secretary are marked with an asterisk.

A.

Abernethy, Charles, New York.
Adams, C. K., Ithaca.
Adriance, John P., Poughkeepsie.
Agnew, Alexander M., New York.
Agnew, Cornelius R., M. D., New York.*
Allen, John, New York.*
Allen, Lewis F., Buffalo.
Allen, Wm. M., Harlem.
Alvord, Henry E., Amherst, Mass.
Ames, D. T., Syracuse.
Amsdell, George I., Albany.
Amsdell, T. L., Albany.
Andrews, B. H., Waterbury, Conn.
Angel, Benjamin F., Geneseo.
Appleton, Francis H., West Peabody, Mass.
Archer, George W., Rochester.
Armstrong, W. A., Elmira.
Arnold, B. G., New York.
Arnold, Wm. E., Otego.*
Arnot, Stephen T., Elmira.*
Aspinwall, J. L., Barrytown.*
Aspinwall, W. H., New York.*
Astor, John Jacob, New York.
Atwater, Dwight, Elmira.
Austin, J., Jr., Albany.*
Avery, Ralph H., Canastota.
Aycrigg, Thomas G., Passaic, N. J.*

B.

Babbitt, B. T., New York.
Babcock, F. M., New York.*
Babcock, Samuel D., New York.
Badger, G. F., New York.
Badger, H. M., Elmira.
Bailey, Isaac H., New York.*
Bailey, Nathaniel P., New York.
Bailey, William H., Plattsburgh.*
Baird, David, Springfield Centre.
Baker, Aaron Y., Hammondsport.
Baker, B. F., Hoosick Falls.
Baker, B. M., Rochester.
Baker, I. V., Jr., Comstock's Landing.
Balcom, Uri, Chicago, Ill.
Baldwin, Anson, Yonkers.
Baldwin, Harvey, Syracuse.*
Baldwin, W. A., Wellsburgh.
Banks, John, Bainbridge.
Barber, Amaziah D., New York.
Bard, John, Barrytown.*
Barnard, Charles, Utica.
Barnett, Abraham, Albany.
Barry, Patrick, Rochester.
Bartlett, H. B., Paris.*
Barto, H. D. Trumansburgh.*
Batcheller, Geo. S., Saratoga Spr'gs.
Beadle, E. L., M. D., Poughkeepsie.*
Beadle, Tracy, Elmira.*
Becar, Noel J., New York.*
Beckwith, B. M., Plattsburgh.*
Beebe, William, New York.
Beekman, J. P., Kinderhook.*
Bell, David K., West Brighton.
Bell, John H., West Brighton.
Bell, Thos., Eatontown, N. J.*
Benham, A. B., Dryden.
Benham, E. M., Hopewell Center.
Benham, Murray, Hopewell Center.
Bennett, Miles C., Big Flats.
Bennett, Wm. H., Saratoga Springs.*
Bentley, Henry J., Horseheads.
Bicknell, J. Y., Buffalo.
Bills, O. A., Yonkers.
Birdsall, Benjamin, Mendon Centre.
Birnie, William, Springfield, Mass.
Blake, W. D., Northfield, Vt.

Blanchard, J. H., Utica.
Blessing, Fred. S., Slingerlands.
Bliss, Jonathan, California.
Blood, Isaiah, Ballston.*
Boardman, Truman, Trumansburgh.
Bogart, Wm. H., Aurora.
Bogert, M. D., Blaineville, Neb.
Bonesteel, Peter S., Victor.*
Bonfoy, Seth, West Winfield.
Boorman, James, Hyde Park.*
Bostock, E., Albany.
Boswell, John, Chili.*
Bouck, Tobias, Cobleskill.*
Boughton, Chauncey, Halfmoon.
Bowditch, Edward, Albany.
Bowen, H., Medina.
Bowen, Henry C., Brooklyn.
Bowen, O. F., West Lowville.
Bowne, Robert, New York.*
Bowne, S. R., Rhinebeck.
Bowne, Walter, Flushing.
Boyce, Kerr, Flushing.
Boynton, Major E. C., Newburgh.
Bradley, Geo. C., Watertown.
Bradley, S. W., Olean.*
Brainard, E. D., Albany.
Breese, Henry G., Hoosick.
Breese, Ira L. Horseheads.
Breese, Ulysses, Horseheads.
Breese, Wellington E., Horseheads.
Briggs, Geo. B., New York.
Bristol, Wheeler H., Owego.
Brizee, Tunis, Pittsford.
Brodie, Wm. A., Geneseo.
Brooks, Daniel E., New York.*
Brown, Alexander, New York.
Brown, D. D. S., Rochester.*
Brown, Geo. D., Syracuse.
Brown, Geo. H., Millbrook.
Brown, Henry K., Newburgh.*
Brown, James, New York.*
Brown, J. Carter, Providence, R. I.
Brown, J. Emery, Churchville.
Brown, J. K., Holland Patent.
Brown, James P., Utica.
Brown, J. Tilden, M. D., Bloomingdale.
Brown, Jesse, Jr., Jamaica.
Brown, John, Webb's Mills.
Brown, John Crosby, New York.
Brown, Lewis B., New York.
Brown, Lewis M., New York.
Brown, Samuel H. Millbrook.*
Brown, William J., Fairhaven.
Brown, Wm. Smith, New York.
Bruen, Alexander M., Scarsdale.
Bryce, William, New York.
Bryden, Robert, New Hartford.
Buck, A. H., Lowville.
Buckley, Wade, Port Jervis.
Buell, William, Rochester.*
Bulkley, D. A., Williamstown, Mass.
Burch, H. M., New York.
Burch, S. J., Bethlehem.
Burden, I. Townsend, Troy.
Burden, Jas. A., Troy.
Burdick, Orrin H., Auburn.
Burkhalter, Chas., New York.
Burr, Wm. M., Jr., Cazenovia.
Butler, B. C., Luzerne.*
Butler, Chas., Hartsdale.
Butterfield, Charles E., Utica.*
Butterfield, Daniel, New York.
Butterfield, John, Utica.*
Butterfield, John, Jr., Utica.
Butts, George, Manlius.
Byram, A. G., New York.

C.

Cady, Charles, Dryden.
Callanan, Henry, Albany.*
Cameron, R. W., New York.
Camman, Herman H., New York.
Camp, Hugh N., New York.
Campbell, Jas. K., D. D., New York.
Campbell, John, New York.
Campbell, John S., New York Mills.
Campbell, Samuel, New York Mills.*
Campbell, Wm. Bayard, New York.
Canfield, Clarence W., Athens, Pa.
Cannon, Le Grand B., New York.
Cantwell, Thomas W., Albany.
Carpenter, Franklin, Gansevoort.
Carpenter, Isaac S., Shekomeko.
Carpenter, James, Wellsburgh.
Carr, Samuel M., Elmira.
Carroll, Chas. H., Geneseo.*
Cartter, David K., Rochester.
Cary, H. N., Whitesboro.*
Case, Henry, Jr., Auburn.
Case, Thos. R., Simsbury, Conn.
Catlin, D. W., New York.

Catlin, Geo. L., Apalachin.
Chamberlain, D. D., New York.*
Chamberlain, Frank O., Canandaigua.
Chamberlain, Olcott A., Richfield.
Chamberlain, Wm. L., Red Hook.*
Chambers, James, Scarsdale.
Champlain, Marshall B., Cuba.*
Champlin, Charles D., Hammondsport.*
Chapman, Crocker C., Hoosick Falls.
Chatfield, A. F., Albany.
Chatfield, T. I., Owego.*
Chauncey, Henry, Jr., New York.
Cheesboro, E., Albany.
Childs, J. Morris, Utica.
Childs, Silas D., Utica.*
Chipman, Henry W., Chicago.
Chittenden, S. B., New York.
Chrystie, Albert N., Havre, France.
Church, Elihu, Riga.*
Church, Richard, Belvidere.
Church, Walter S., Albany.
Churchill, A., Utica.*
Claflin, Horace B., Brooklyn.*
Clark, J. B., Elmira.*
Clark, Leander, Newburgh.
Clark, Wm. J., Horseheads.
Clarke, Alfred, Springfield.*
Clarke, Almonde, Whitestone.
Clarke, George, Otsego.
Clarkson, Augustus, Potsdam.*
Clarkson, Levinus, Potsdam.*
Clarkson, T. Streathfield, Jr., Potsdam.
Clement, Isaac, Mechanicville.*
Coan, Luke, Westmoreland.
Coates, George, Elmira.
Cobb, Emory, Kankakee, Ill.
Cocks, Isaac H., Old Westbury.
Coffin, Edmund, New York.
Cogswell, P. J., Rochester.
Cogswell, Wm. L., New York.
Cole, Walter, Batavia.
Coleman, Robert B., New York.
Collender, Hugh W., New York.
Congdon, George, Elmira.*
Conger, A. B., Waldberg.*
Conklin, John P., Saratoga Springs.*
Converse, Geo. W., Winchendon, Mass.*
Cook, E. G., Belleville.
Cook, Frederick, Rochester.
Cooke, Rolland C., Whitehall.
Coon, Morell, West Edmeston.
Cooper, Joseph M., New York.
Copeman, A. S., Utica.*
Corey, John A., Saratoga Springs.*
Cornell, Alonzo B., Yonkers.
Cornell, Chas. Ezra, Yonkers.
Cornell, Ezra, Ithaca.*
Cornell, Franklin C., Ithaca.
Cornell, H. W., Albany.
Cornell, O. H. Perry, Albany.
Corning, Erastus, Albany.*
Corning, Erastus, Albany.
Corning, Erastus, Jr., Albany.
Cossitt, Davis, Onondaga.
Coulter, J. E., New York.
Cowdin, Elliott C., New York.*
Cox, James W., Jr., Albany.
Crandall, Wm. De Loss, West Edmeston.
Crane, John J., Morrisania.
Crapo, John M., Albany.
Crawford, J. F., Syracuse.*
Crego, Russell, Albany.
Crittenden, Norman, Ithaca.*
Crocker, David, Jr., New York.
Crofoot, Jas. R., Constableville.
Cromwell, Wm., New York.*
Crosman, C. F., Rochester.*
Crosman, C. W., Rochester.
Crozier, Wm., Northport.
Cunard, Sir Edward, New York.*
Cunningham, Jas. B., White Plains.
Curtis, Chas. E., Ithaca.
Curtis, E. L. B., Danby.
Curtis, Dewitt C., Horseheads.
Curtis, Frank D., Charlton.
Curtis, George, Elmira.
Curtis, N. Martin, Ogdensburgh.
Curtis, R. E., Binghamton.*

D.

Dagge, Edward, Rochester.
Dagwell, John, Utica.*
Dater, James, New York.
Dater, Philip, New York.
Davenport, Chas. L., Syracuse.*
Davis, J. C. Bancroft, Washington, D. C.

De Angeles, W. W., Holland Patent.
Decker, David, Elmira.
Dederick, Levi, Albany.
Dederick Peter K., Albany.
De Forest, D. W. C., De Freestville.
De Forest, Jacob J., Duanesburgh.
De Freest, John K., De Freestville.*
De Freest, Martin D., De Freestville.*
De Graff, Alfred, Fonda.
De Grau, Aaron A., Jamaica, L. I.
Delafield, John, Oakland.*
Delamater, Cornelius H., New York.
Delavan, Henry W., Ballston.*
De Long, M. B. Utica.
Demarest, Abram A., New York.
Dennistoun, Wm., New York.*
Deuel, Stephen T., Little Rest.
Devereux, John C., Ellicottville.*
Dewater, Wright, Elmira.*
Dewey, C. D., Port Leyden.*
De Witt, Edward, New York.
Dexter, H. W., Newport, N. Y.
Dickey, Charles D., New York.
Dickey, George, New York.
Didama, John E., Medina.
Dike, Henry A., New York.
Dike, James P., New York.
Dill, John B., Auburn.*
Dillon, Robert B., New York.
Dinsmore, Wm. B., Staatsburgh.*
Diven, Alexander, Elmira.
Diven, Alexander S., Elmira.
Diven, Eugene, Elmira.
Dodge, Henry, Washington Mills.
Dodge, J. P. B., Esopus.
Dodge, Wm. E., New York.*
Doelker, George, Albany.
Dollner, Harold, New York.
Doncaster, Daniel, Mechanicville.
Doolittle, Charles H., Utica.*
Dorland, W. L., Nebraska.*
Dounce, Wm. J., Elmira.
Douw, V. P., Albany.*
Downer, Charles, Utica.
Dows, Ammi, Charlton.*
Dows, David, New York.
Doyle, William, Albany.
Draper, Simeon, New York.*
Dwight, J. W., Dryden.*

E.

Earle, Morris, New York.
Eastman, Wm. L., Ovid.
Eaton, Edward O., Troy.*
Eckenberger, Haman, Elmira.
Eddy, John W., Saratoga.
Edmonds, F. W., Bronxville.*
Edwards, Edward, South Corinth.*
Elliott, John, New York.
Ellis, Edwin, Albany.
Ellis, John C., Schenectady.*
Ellsworth, S. H., Starkville.
Ellwanger, George, Rochester.
Ely, Francis A., Deansville.
Ely, Joseph E., Binghamton.
Ely, Wm. M., Binghamton.*
Emmett, Thos. Addis, Astoria.*
Erwin, Charles H., Painted Post.
Erwin, E. H., Painted Post.
Erwin, George Z., Potsdam.
Everett, Wm. E., Rye.

F.

Faile, Chas. V., New York.
Faile, Edward, New York.*
Faile, Edward G., New York.*
Faile, Henry, New York.*
Faile, Samuel, White Plains.
Faile, Thos. H., New York.*
Faile, Thos. H., Jr., New York.
Fairbanks, Erastus, St. Johnsbury, Vt.*
Fairbanks, Horace, St. Johnsbury, Vt.*
Fairbanks, Thaddeus, St. Johnsbury, Vt.*
Farwell, Samuel, Utica.*
Faulkner, Lester B., Dansville,
Faxton, Theo. S., Utica.*
Fell, John, Elmira.
Fellows, Benjamin, Chili.
Fellows, Joseph, Bath.*
Ferguson, Amos, Utica.*
Ferris, John, Moresville.*
Ferris, Wm. L. Westchester.*
Fields, P. H., Geneva.*
Filley, Samuel R., Woodstock.
Finlay, J. Beekman, Saratoga Springs.*
Fish, Liberal C., Laporte, Iowa.

Fish, Sanford N., Pine Valley.
Fitch, Asa, M. D., Salem.*
Fitch, Mason P., Elmira.*
Flagler, Benjamin, Suspension Bridge.
Forbes, Paul S., Greenbush.*
Ford, Henry A., Albany.
Ford, William, Big Flats.
Ford, William F., West Davenport.
Foster, Edmund B., Los Angeles, California.
Foster, Frederick G., New York.
Foster, H. Ten Eyck, Lakeland.*
Foster, James S., New Hartford.*
Fowler, C. Gilbert, Newburgh.*
Fox, Eli, M. D., Mohawk.
Fox, George S., West Farms.*
Fox, William W., New York.*
Frame, William, Flushing.
Frazer, Kasson, Syracuse.*
Freeman, Isaac, Bemis Heights.
Freeman, Jonathan W., Troy.*
Freer, S. D. Cortlandville.*
French, Henry C., Wells, Penn.
French, J. D. W., North Andover, Mass.
French, L. L., Richfield Springs.
Frost, J. T., Clinton Point.
Frothingham, Wm. M., M. D., Washington Heights.
Fuller, D. B., New York.*
Fulton, Levi S., Rochester.
Furman, John M., New York.

G.

Gaffers, Jeremiah, Newtonville.
Galbraith, Thomas, Washington Hollow.
Gallup, S. M., New York.
Gandy, Shephard, New York.
Gardenier, A. B., Niverville.
Gauley, William M., New York.*
Geddes, George, Fairmount.*
Geddes, James, Fairmount.
Geer, Robert, Albany.
George, Thomas, Newburgh.
Getman, Arthur, Cambridge, Mass.*
Gibbs, J. E., Watertown.
Gibbs, R. B., Harpersfield.*
Gibson, Richard, Delaware, Can.
Gibson, William L., Elmira.
Gilbert, E. M., Utica.*
Gleason, R. S., West Troy.
Glenn, W. W., Baltimore, Md.*
Goewey, John A., Albany.*
Goldsmith, Alden, Blooming Grove.*
Goldsmith, R. F., West Southold.
Goodhue, J. C., Elmira.*
Goodman, R., Lenox, Mass.
Gordon, Robert, New York.
Gould, David G., Quaker Hill.
Gould, John C., Albany.*
Gould, J. Stanton, Hudson.*
Gould, Thomas, Aurora.*
Graham, James H., Delhi.*
Gramman, William, Newark, N. J.
Granger, Foster O., Saratoga Springs.
Granger, Gideon, Canandaigua.*
Granger, Oscar, Saratoga Springs.*
Grant, Israel P., Horseheads.
Gratzinger, Almon, Elmira.*
Gray, Wm. H., Utica.
Green, Andrew H., New York.
Green, John C., New York.*
Greenman, Silas C., Utica.*
Greenway, John, Syracuse.*
Greer, Thomas H., Albany.
Gregory, H. C., Unadilla.
Greig, John, Canandaigua.*
Grice, C. C., V. S., New York.
Gridley, O. B., Waterville.
Griffin, Elihu, Clinton Corners.*
Griswold, Alpha D., Southport.
Griswold, John A., Troy.*
Gunn, Simeon W., Clinton.

H.

Habirshaw. W. M., New York.
Hagan, William E., Troy.
Hager, John G., Rhinebeck.*
Haight, Edward, Westchester.*
Hall, F. G., Elmira.
Hall, Peleg, New York.
Hallett, J. S., New York.
Hamilton, David, Watervliet.*
Hamilton, William, Westmoreland.
Hand, Thomas J., Sing Sing.
Harberger, John S., New York.*
Harder, Minard, Cobleskill.
Harison, Francis, D. D., Troy.*
Harison, George D. L., New York.

Harison, Richard M., New York.
Harison, Thomas L., Morley.
Harold, John, Hempstead.*
Harris, Joseph, Rochester.
Harrison, R. L., Hoosick Falls.*
Hart, C. H., Syracuse.
Hart, H. R., Utica.
Hart, William Howard, Troy.*
Hartshorne, George, Rahway, N. J.
Haskell, William H., Albany.
Hastings, George F., Shushan.
Hatch, Lewis M., Asheville, N. C.
Haupt, Henry H., Dryden.
Havemeyer, Frederick C., New York.
Haven, John, Fort Washington.
Haviland, Isaac E., Hempstead.
Hawks, E. B., Wells Bridge.
Hawley, J. S., Binghamton.*
Hay, A. B., Troy.*
Hayes, Clark I., Unadilla.
Hayward, Edwin S., Rochester.
Heath, Allen S., New York.
Heffron, D. S., Utica.*
Hendrick, James, Albany.
Herrick, Elias H., New York.*
Herrick, Jacob B., New York.*
Herrick, John H., New York.
Herrick, Jonathan R., Albany.
Herring, Silas C., New York.*
Hess, Elmon, West Somerset.*
Heustis, Hugh, Adams.*
Hexamer, Frederick M., New Rochelle.
Heyne, Carl, Red Hook.*
Hibbard, Charles, Sprout Brook.
Hicks, Benjamin D., Old Westbury.
Hill, David, Albany.
Hilton, James, New Scotland.
Hilton, Joseph, New Scotland.
Hilton, William J., Albany.*
Hinkley, David J., Brookfield.
Hoadley, Luther, Harwinton, Conn.
Hoag, Claudius L., Lockport.
Hodge, John, Lockport.
Hoe, Peter S., Tarrytown.
Hoe, Richard M., New York.*
Hoffman, George W., Elmira.
Hoffman, Henry C., Horseheads.*
Hoffman, Joseph, Elmira.*
Hoge, William, Tarrytown.*
Holbert, George W., Elmira.
Holbert, Joseph E., Chemung.
Holbert, Joshua S., Chemung.
Holden, Edward C., McGrawville.
Holmes, A. B., New York.
Holmes, Henry C., Quaker Springs.*
Holmes, William M., Greenwich.*
Hooker, Horace M., Cooperstown.
Hopkins, Henry, New York.*
Hopkins, Hiram P., Buffalo.
Hopkins, Lucius, New York.
Hopkins, Obadiah, New York.
Hopkins, William R., Utica.
Hotchkin, Samuel, Elmira.
Houghton, W. J., ——.
Houpt, Henry H., Dryden.
Housman, Charles H., Valatia.
Hovey, C. M., Boston.*
Howe, Walter, New York.
Howell, Benjamin H., Middletown.
Howland, Joseph, Matteawan.*
Howland, Obadiah, Auburn.
Hoxie, Samuel L., Leonardsville.
Hoxie, Solomon, Whitesboro.
Hoyt, Alfred M., New York.
Hoyt, D. C., Saratoga Springs.
Hubbell, Alrick, Utica.*
Hubbell, Eli S., Elmira.*
Hull, Sylvester, Horseheads.
Hungerford, Solon D., Adams.*
Hunt, Ward, Utica.*
Hunt, Wilson G., New York.*
Huntington, Benjamin N., Rome.*
Huntington, Edward, Rome.*
Hurlburt, H. A., New York.
Hurst, William, Albany.*
Husted, James W., Peekskill.
Hutchinson, Charles W., Utica.

I

Ingalsbe, Grenville M., Sandy Hill.
Ingalsbe, H. H., South Hartford.
Ingalsbe, Jas. L., South Hartford.
Ingalsbe, Milo, South Hartford.
Ingalsbe, Royal, South Hartford.
Ingersoll, George, Fonda.
Irvin, Richard, New York.
Irwin, D. B., Middletown.*
Isham, Wm. B., New York.
Ives, Julius, Geneva.*
Ives, Julius, Jr., Geneva.*

J.

Jackson, George, Albany.*
Jackson, George P., Albany.*
Jackson, John C., New York.
Jaffray, Edward S., New York.
James, Roscoe C., Hoosick.
James, S. B., Hoosick.
Jaques, Hiram M., Wright's Corners.
Jay, John, Katonah.
Jenkins, Jonathan H., Elmira.
Jervis, John B., Rome.*
Jewell, A. L., Waltham, Mass.
Johnson, Benjamin P., Albany.*
Johnson, Benjamin W., Albany.
Johnson, Bradish, New York.
Johnson, Geo. W., Geneva.
Johnson, H. B., Afton.
Johnson, Jas. Boorman, New York.*
Johnson, R. L., Albany.*
Johnson, Samuel William, Ellicottville.
Johnson, William, Seneca.*
Johnston, John T., New York.
Johnston, William S., Poughkeepsie.
Jones, David R. Floyd, South Oyster Bay.*
Jones, Edward, Rhinebeck.*
Jones, Ira A., Breesport.
Jones, John W., Elmira.
Jones, Morris R., Rome.
Jones, O, W., New York.
Jones, Richmond, Elmira.*
Judd, Orange, Chicago.
Juliand, Joseph, Bainbridge.

K.

Kane, W. H., New York.
Keays, Edward, Albany.
Keeler, Edw'd., Danby.
Keeler, Edw. Elmer, Danbury, Ct.
Keene, S. S., M. D., New York.
Keese, Samuel T., New York.
Kellogg, P. V., Utica.*
Kelly, Henry, New York.*
Kelly, Patrick, West Troy.
Kelly, William, Rhinebeck.*
Kelly, William, Jr., New York.
Kennedy, R. Lenox, New York.
Ketchum, Morris, New York.
Kidder, K. P., Burlington, Vt.
Kincaid, Jas. C. P., Utica.
King, John A., Jamaica.*
King, John A., Jr., Great Neck.
King, Peter V., New York.*
Kingsland, Thomas B., New York.
Kirby, William A., Auburn.
Kirke, George Wistar, New York.
Kirtland, B. B., Greenbush.*
Knickerbocker, David M., Albany.

L.

Labishiner, Emmanuel, Albany.
Lambert, Wm. G., Jr., Chappaqua.
Landon, William, Albany.*
Lane, George W., New York.*
Langdon, Charles J., Elmira.
Langworthy, Hollum, West Edmeston.
Langworthy, Irwin, South Brookfield.
Lansing, Charles, Lansingburgh.
Lathrop, Ariel, Albany.
Lathrop, Daniel S., Albany.*
Lawrence, De Witt C., New York.
Lawrence, Edward A., Bayside.
Lawrence, F. N., Flushing.
Lawrence, Lewis H., Utica.
Lawyer, Luther, Perch River.
Lay, Frederick W., Greece.
Leach, Almon, Utica.
Leavitt, Henry S., New York.
Ledyard, L. W., Cazenovia.
Lee, David B., New York.
Lee, John R., Buffalo.
Lee, William, Schenectady.*
Lee, William H., New York.
Leggett, Edward W., Harlem.*
Leland, Charles E., Harrisburg, Pa.
Leland, Simeon, New York.*
Leland, Walter W., Saratoga Springs.*
Lenox, James, New York.*
Leonard, Moses G., Rockland Lake.*
Le Ray de Chaumont, James, Le Raysville.*
Leverich, Charles D., Newtown.
Leverich, Charles P., New York.
Leverich, S. Duncan, Kidder's Ferry.
Lewis, David W., New York.

Lewis, Harris, Frankfort.
Lewis, John G., Frankfort.
Lewis, Oscar J., Schodack Centre.
Lexow, Rudolph, Nanuet.
Liautard, A. F., M. D., New York.
Linklaen, Ledyard, Cazenovia.*
Littlefield, R. M,, Afton.
Livermore, Charles F., New York.
Livingston, Edward P., Clermont.*
Livingston, Hiram, Albany.*
Livingston, John Henry, Clermont.
Livingston, Robert, Jr., New York.
Locke, James S., Millport.
Lockwood, E., New York.*
Lockwood, G., New York.*
Look, Samuel J., Louisville, Ky.
Loomis, H. B., New York.
Lord, H. G., ———.
Lord, J. Cooper, New York.*
Lorillard, L. S., New York.
Lormore, William J., Elmira.
Lovell, Reuben, Elmira.*
Lowber, Robert W., New York.
Lowman, F. C., Nichols.
Ludlow, Wm. H., Oakdale.
Lyman, David, Middlefield.*
Lynd, George P., Albany.

M.

McCall, James S., Geneva.
McCann, George S., Elmira.
McCann, James, Elmira.
McCann, James, Jr., Elmira.
McCann, John, Elmira.
McCarthy, Patrick, Albany.
McCarthy, Thomas, Albany.
McCredy, Dennis A., New York.*
McDougal, Gen. C. D., Auburn.
McGraw, John, Ithaca.*
McGraw, Joseph, Dryden.
McGraw, Thomas, Albany.
McHarg, John W., Albany.
McIntyre, Archibald, Albany.*
McIntyre, J. McDonald, Hudson.
McKinney, James, Albany.
McNeil, R. C., Campville.
McNish, Charles W., Ovid.
Macomb, John Navarre, Jr., Branchport.
Magone, Daniel, Ogdensburg.
Mahar, Michael, Millbrook.
Mairs, James W., Schenectady.
Maitland, Robert L., New York.*
Maitland, William C., Fordham.
Mann, J. F., Utica.
Marcy, John S., Riverhead.*
Marks, Enoch, Camillus.*
Martin, William R., New York.
Martyn, Albert T., Canton.
Marvin, Jas. M., Saratoga Springs.
Mason, Daniel C., Joliet, Ill.
Mason, John W., Brooklyn.
Mason, S. M., New Hartford.*
Masterton, Alexander, Boonville.
Masterton, Robert M., Bronxville.
Mather, F. E., New York.
Mather, Joshua, Utica.
Mathewson, Park, New York.
Matteson, James M., Jacksonville.
Matteson, O. B., Utica.
Matther, Charles S., West Troy.
Matthewson, J. E., New Berlin Centre.*
Mattoon, Wm., Springfield, Mass.*
Mauran, S. E., White Lake.
Maxon, G. G., Schenectady.*
Maxon, Thomas V., Adams.
Maxwell, Hugh, New York.*
Mecke, John A., New York.
Mekeel, Abram V., North Hector.
Melick, William B., Albany.
Merchant, Abel, Nassau.
Merriam, Charles M., Leyden.
Merriam, Clinton L., Leyden.
Mesick, Peter, Albany.
Messenger, Thomas, Great Neck.*
Messenger, W. S., Great Neck.*
Meyer, Theo. F. M., New York.
Middleton, Robert, Utica.
Millard, S. A., Clayville.*
Miller, Brayton B., Leyden.
Miller, Charles D., Geneva.
Miller, C. Dudley, Jr., New York.
Miller, Daniel S., New York.*
Miller, Dudley, Oswego.
Miller, Gerrit S., Peterboro.
Miller, James M., New York.*
Miller, Peter, Fredonia.
Miller, Seth, Constableville.*
Mills, George F., Fonda.
Mills, James R., Hoboken, N. J.
Mills, M. H., Rochester.*
Minturn, Robert B., New York.*

Mitchell, O. M., Saratoga Springs.*
Mitchell, Samuel L., New York.
Mixter, David E., Jordanville.
Moffatt, John N., New York.*
Moller, William F., Irvington.*
Moon, C. B., Saratoga Springs.
Moore, D. D. S., Rochester.*
Moore, D. D. T., New York.
Mordoff, M. C., Rochester.
Morgan, Henry A., Aurora.*
Morgan, J. E., Deerfield.
Morrell, Robert, Manhasset.
Morris, A. Newbold, Barton.
Morris, Fordham, Fordham.
Morris, Francis, Fordham.*
Morris, Lewis G., Fordham.
Morrison, James M., New York.*
Morss, B. G., Red Falls.*
Mortimer, John H., New York.
Mount, Andrew, New York.
Mowry, J. S., Rome.
Munn, Samuel, Mott Haven.
Munroe, Allen, Syracuse.*
Munson, E., Tyre.
Murray, George, New York.
Musselman, Chauncey, Phelps.
Myers, John K., Yonkers.
Myers, Marvin E., Charlton.

N.

Neish, William, Hamden.
Nellis, A. J., Bath.
Nelson, George P., Scarsdale.
Newton, William, Henrietta.
Norman, Thomas E., Albany.
Norton, Robert, New York.
Nourse, J., Boston, Mass.*
Nusbaum, Israel, Albany.

O.

O'Brien, B., Albany.
Odell, William T., Ballston.*
Ogden, Gouverneur M., New York.
Ogden, William B., High Bridge.*
Oliver, Robert S., Albany.
Olmsted, Henry M., Morristown, N. J.
Osborn, Amos O., Waterville.
Osborn, Charles W., Albany.*
Osborn, John W., Albany,*
Osborne, David M., Auburn.*
Osborne, John H., Auburn.
Osgood, Jason C., Troy.*
Ostrander, W. P., Schuylerville.
Otis, H. G., Geneva.*
Owen, Henry W., Chemung.*
Owen, Jesse, Chemung.

P.

Page, John R., Sennett.
Palmer, Allen B., Geneva.*
Palmer, A. S., Albany.
Palmer, A. W., Amenia.*
Palmer, J. L., Adams Centre.*
Palmer, N., Hudson.
Palmer, T. G., Hudson.
Park, Joseph, New York.
Parke, H. S., New York.
Parker, Amasa J., Jr., Albany.
Parks, Jonas, Horseheads.
Paton, Thomas, New York.
Paton, William, New York.
Patrick, Marsena R., Dayton, O.
Patterson, Albert M., Geneva.
Pearsall, N. B., Morris.
Pease, James D., Corning.
Pease, Richard H., New York.*
Peck, Benj. F., East Bethany.
Peck, Edgar F. (M. D.), Brooklyn.*
Peebles, W. A., Martinsburgh.
Peet, Harvey P., New York.*
Peet, Isaac Lewis, New York.
Pell, Robert L., Pelham Farm.*
Pellew, Henry E., Katonah.
Penfold, Edmund, New York.*
Penfold, E., Jr., New York.
Penfold, William Hall, New York.
Perkins, F. E., Providence, R. I.
Perry, John S., Albany.
Peters, T. C., Darien.*
Peugnet, Charles, Cape Vincent.
Phelps, Peter, Derby, Conn.
Phelps, Royal, New York.*
Phelps, Thomas W., New York.
Phillips, Marcus H., Hulburton.
Pierson, Henry L., New York.
Pierson, Henry R., Albany.
Pinckney, Stephen R., New York.*
Pine, Al, Pittstown.
Pine, George W., Herkimer.
Pinkney, Thompson, Bronxville.

Platt, James N., New York.
Plumb, Josiah B., Albany.*
Pomroy, William H., New York.
Popham, William H., Scarsdale.
Porter, Peter A., Niagara Falls.
Post, William, New York.*
Potter, Cranston B., Elmira.
Potter, Howard, New York.
Potter, Lewis, Easton.
Powell, Edw'd A., Syracuse.
Pratt, Russell W., Camden, N. J.
Pratt, Zadock, Prattsville.*
Prentice, Ezra P., Albany.*
Prentiss, J. H., Utica.
Prescott, T. A., Sandy Hill.
Price, George H., Albany.*
Priest, D. E., Utica.*
Priest, Zenas C., Utica.*
Proctor, Thomas R., Utica.
Pumpelly, Harmon, Albany.*
Punnett, James, New York.*
Purdy, Samuel M., West Farms.
Pye, Edward, Haverstraw.*
Pyle, James, New York.

R.

Ramsdell, Homer, Newburgh.
Ramsdell, L., Greenville.
Randall, Benjamin, Chicago.
Randall, Henry S., Cortland.*
Randall, Nathan, Syracuse.
Randall, N. W., Bristol Centre.*
Rankin, William, Charlotte.
Rathbone, George, New London.
Rathbone, John F., Albany.
Rathbun, John T., Elmira.
Rathbun, L. W., Warren.
Ray, John P., Hemlock Lake.
Ray, Wesley W., Honeoye, N. Y.
Read, James H., Utica.
Read, J. Meredith, Paris, France.
Read, William G., New York.
Redfield, Frank B., Batavia.
Reed, Almet, New York.
Reeve, John H., Wells' Corners.
Reid, James R., Elmira.
Remington, Eliphalet, Cazenovia.*
Remington, M. C., Weedsport.
Reynolds, M. F., Rochester.
Reynolds, Samuel T., Elmira.
Richards, A. C., Fort Washington.
Richardson, Thomas, West Farms.*
Richardson, Wm. P., Goshen, N. Y.
Rider, Zerah, Cambridge.
Riggs, C. G., Turin.
Ripley, Joseph, New York.
Robbins, George A., New York.
Roberts, Isaac P., Ithaca.
Robie, Chas. H., Savona.
Robinson, Charles, New York.
Robinson, Chauncey N., Elmira.*
Robinson, Henry, Newburgh.*
Robinson, John A., Elmira.
Robinson, W. D., Kanona.
Rock, Samuel, West Point.
Rockwell, A. B., Elmira.*
Rockwell, Daniel B., Horseheads.*
Rockwell, H. Fletcher, Horseheads.
Rockwell, John B., Elmira.
Rockwell, Jonathan, Pine Valley.
Rockwell, S. D., New York.
Rodgers, L. M., Newtonville.*
Rogers, Daniel E., Wheatland.
Rogers, Henry W., Buffalo.
Ronan, Patrick, Elmira.*
Root, Curtis, Gasport.
Root, Fred. P., Brockport.
Root, Samuel, Westport.
Rose, David, Albany.*
Rosevelt, Theo., New York.
Rotch, Francis, Morris.*
Rotch, Francis M., Morris.*
Rowe, Jacob, Poughkeepsie.*
Runyan, Vincent L., Seneca Castle.
Rust, Philio N., Syracuse.*
Rutherford, Thos. H., East Chester.*
Rysdorph, Lawrence, Greenbush.

S.

Safford, Halsey, East Otto.*
Sampson, George G., Brooklyn.
Sanders, J. H., St. Johnsville.
Sanders, Walter T. L., Schenectady.
Sands, A. B., New York.*
Sanford, Charles, Schenectady.*
Sanford, George H., Schenectady.*
Saunders, Thomas P., Adams.
Savage, Charles, Elmira.
Savage, Thomas, New Hartford.
Saxton, C. M., New York.
Sayre, Willis B., Horseheads.
Scharck, Anthony, DeFreestville.

Schenck, William J., New York.
Schoonmaker, Henry, Cedar Hill.
Schreiner, O. H., New York.
Schultz, Jackson S., New York.
Schuyler, Gerritt L., Watervliet.
Schuyler, Isaac L., Manchester, Vt.
Schuyler, Peter C., New York.
Schuyler, Philip S., Watervliet.
Schuyler, Richard P., West Troy.
Scott, John H., New York.
Scoville, J. V. H., New Hartford.
Seaman, P., California.
Seeber, Eli J., Depauville.
Seegur, Hiram, Adams.
Seeley, D. W., Albany.
Selkreg, John H., Ithaca.
Seney, George I., New York.
Seward, William H., Auburn.*
Seymour, Horatio, Utica.*
Seymour, John F., Utica.
Shanahan, James, Tribes Hill.
Sharp, Jacob, Rome.*
Shattuck, Lewis H., Westmoreland.*
Shaw, George, Deerfield.
Shaw, Patrick H., Albany.*
Sheafe, John Fisher, New Hamburgh.
Sheldon, Henry K., New York.
Sheldon, James, Geneva.
Sheldon, James O., New York.
Sheldon, Lucius M., Brooklyn.
Sherman, Benjamin B., New York.*
Sherman, B. L., New York.
Sherman, C. A., New York.
Sherman, Ira E., Sidney Plains.
Sherman, Samuel, Lundey's Lane.
Sherman, William C. H., Newburgh.*
Sherrill, E., New Hartford.*
Sherrill, Eliakim, Geneva.*
Sherrill, Lewis, Greenville.
Sherwood, Frederick, New York.*
Sherwood, John M., Auburn.*
Shonnard, E. F., Yonkers.*
Simpson, George G., Brooklyn.
Simpson, J. B., Jr., New York.
Simpson, John V., West Farms.
Simpson, William, West Farms.
Simpson, William, Jr., New Hudson.
Simpson, ——, White Plains.*
Sisson, George M., Genoa.
Slee, John D. F., Elmira.
Slingerland, William H., Normanskill.
Sloan, Samuel, New York.
Smead, Dr. C. D., Logan.
Smith, Albert, New Rochelle.
Smith, Daniel D., New York.
Smith, Gabriel L., Elmira.
Smith, J. Wesley, Albany.*
Smith, Lewis M., Elmira.
Smith, M. M., Lowville.*
Smith, N. Everett, New York.
Smith, Silas G., Mechanicville.
Smith, Solomon P., Waterford.
Smith, Thomas, New York.
Smith, W. Brown, Syracuse.
Smith, W. Harrison, Geneva.
Smith, W. Judson, Syracuse.
Smith, Wing R., Syracuse.
Smull, Thomas, New York.*
Soule, Alexander C., Syracuse.
Southworth, John, Dryden.*
Southworth, John Ellis, New York.*
Southworth, ——, Utica.*
Spaulding. Henry F., New York.
Spencer, J. E., Utica.
Spencer, Lorillard, Westchester.
Spinner, John D., Herkimer.*
Spoffard, Eugene W., Elmwood.
Spofford, Joseph L., New York.
Spofford, Paul, New York.*
Spriggs, J. Thomas, Utica.
Staley, Daniel G., Albany.
Standring, L. S., Deer River.
Stanford, Charles, Schenectady.*
Starin, John H., Fultonville.
Stephens, Henry F., Syracuse.
Stephenson, George S., New York.
Stetson, Charles A., New York.*
Stevens, E. R., Saratoga Springs.*
Stevens, F. C., Attica.
Stevens, S. W., Rochester.
Stillman, Charles, Woodstock.
Stockwell, S. S., New York.
Stoddard, Increase B., Horseheads.
Stoddard, Joshua C., Lockport.
Storm, Joseph H., Green Haven.
Story, Richard J., Greenbush.
Story, Richard R., Albany.
Strong, Benjamin W., Newtown.
Stuart, Alexander, New York.*
Stuart, Robert L., New York.*
Sturgis, Jonathan, New York.

Sturtevant, E. Lewis, M. D., South Framingham, Mass.
Stuyvesant, John R., Stuyvesant, Kansas.
Suffern, Andrew, Elmira.
Suffern, John, Maryland.
Sutherland, J. H., Pittsford.
Suydam, Henry, Jr., New York.*
Swain, James P., Bronxville.
Swain, Thomas M., Bronxville.
Swan, Benjamin L., Jr., Oyster Bay.
Swan, Robert J., Geneva.
Swan, William H., New York.
Sweeney, Capt. A. H., Albany.
Sweet, Anson A., Syracuse.
Sweezy, George W., New York.

T.

Taber, Samuel T., Roslyn.*
Tallmadge, Samuel, Valatia.
Tappan, John L., New York.*
Taylor, Edwy L., Albany.
Taylor, E. W., Elmira.
Taylor, John W., Grand Rapids, Mich.
Ten Broeck, Walter L., Rhinebeck.
Terry, Edmund, Waterville.*
Thayer, Adin, Hoosick Falls.
Thomas, Burton A., Sand Lake.*
Thomas, Herman, Saratoga Sp'ngs.*
Thomas, Jeffrey P., Albany.
Thomas, John, Frankfort.*
Thompson, Frederick, New York.
Thompson, James, Ballston.*
Thompson, Samuel L., Setauket.*
Thorne, Edwin, New York.
Thorne, Jonathan, New York.*
Thorne, Samuel, New York.
Thorne, Stephen, Utica.*
Tibbetts, Lester G., New Scotland.*
Tifft, Reuben, Pine Valley.*
Tillman, Mrs. Emeline, Elmira.*
Titus, Charles M., Ithaca.
Titus, James H., Malone.*
Tobey, Arthur, Pittsford.*
Tobey, Reuben, Pittsford.
Tobey, Silas W., Hudson.
Tomes, Francis, Jr., New York.
Tompkins, Daniel D., Medina.
Toole, William S., New York.
Townsend, E., Pavilion.
Townsend, John, Albany.*
Tracey, Benj. F., Owego.
Tripp, Lemon B., North Castle.
Tucker, Luther, Albany.*
Tucker, Luther H., Albany.
Turner, Benjamin, Horseheads.
Turner, David, Veteran.
Turner, David J., Horseheads.
Turner, Stephen J., Horseheads.
Tweddle, George, Baltimore, Md.
Tweed, William M., New York.*
Tyler, Joel, Springwater.

U.

Underhill, Daniel, Jericho, L. I.
Underhill, Richard T. (M. D.), Croton Landing.
Underwood, G. F., Jericho.
Upham, A. S., Le Roy.*

V.

Vail, George, Troy.*
Van Allen, Edwin, Bethlehem.
Van Alstyne, P. Edward, Kinderhook.
Van Antwerp, John, New York.
Van Benthuysen, Arthur L., Albany.*
Van Benthuysen, Charles, Albany.*
Van Benthuysen, Charles H., Albany.
Van Buren, William H. (M. D.), New York.
Vanderveer, Theo. B., Amsterdam.
Vanderveer, George, Port Jackson.
Van Deusen, H. A., Canajoharie.
Van Duzer, Jonas S., Horseheads.
Van Duzer, William H., Horseheads.*
Van Gorder, Robert B., Elmira.
Van Hoesen, John I., Castleton.
Van Horn, G. H. F., Fonda.
Van Horn, Levi, Minaville.*
Van Orden, William H., Catskill.
Van Pelt, Henry, New York.
Van Rensselaer, Robert H., Morris.
Van Rensselaer, Stephen, Albany.*
Van Rensselaer, Stephen, Jr., Albany.*
Van Rensselaer, Wm. P., Albany.*

Van Vranken, Wm., Schenectady.
Van Wagenen, Jared, Lawyerville.
Van Wie, Peter, Cedar Hill.*
Vick, Frank H., Rochester.
Vick, James, Rochester.*
Viele, Maurice E., Albany.
Visscher, John, Elmira.
Voight, August, Elmira.*

W.

Wackerhagen, E., Albany.
Wade, Elias, Jr., New York.
Wadsworth, Charles F., Geneseo.
Wadsworth, Craig W., Geneseo.*
Wadsworth, James, Geneseo.*
Wadsworth, James S., Geneseo.*
Wadsworth, James W., Geneseo.
Wadsworth, William A., Geneseo.
Wadsworth, William W., Geneseo.*
Wagstaff, Alfred, Jr., Babylon.
Wainright, Charles S., Rhinebeck.
Wait, David, Otego.
Walbridge, D. T., Rochester.
Walcott, W. D., New York Mills.
Walker, Charles C. B., Corning.
Walker, C. E., Corning.
Walker, William E., Schenectady.*
Walrath, Solomon, Rensselaer Falls.*
Ward, Frank D., Le Roy.
Ward, John, New York.*
Warner, Daniel D., Canaan.*
Warner, George H., New York Mills.
Warner, Horatio G., Rochester.*
Warren, J. Hobart, Hoosick Falls.
Watson, H. M., Buffalo.
Watson, H. R. C., West Farms.
Watson, William, West Farms.*
Watson, W. H., Medina.
Watts, John, Ithaca.
Weed, William H., New York.*
Weed, William W., Buffalo.*
Weld, Mason C., New York.
Welles, John C., Elmira.
Welles, M. H., Elmira.
Wells, Edward, Johnstown.*
Wells, Eugene, Rhinebeck.
Wells, Henry, Aurora.*
Wemple, Edward, Fultonville.
Wemple, Robert, Fultonville.
Wende, B. A., Alden.
Wende, Herman, Alden.
Wendell, Burr, Cazenovia.
Wendell, Charles E., Albany.
Wendell, Edward A., Albany.
Wendell, Herman, Albany.*
Wendell, James V., Albany.
Westlake, John F., Horseheads.
Weston, Frederick, Sandy Hill.*
Wetmore, Benjamin C., New York.
Wetmore, Prosper M., New York.*
Wheeler, Cyrenus, Jr., Auburn.
Wheeler, G. H., Hammondsport.
Wheeler, James A., Pine Valley.
Whipple, William, Medina.
White, Hollis, Niagara Falls.
White, Hugh, Waterford.*
White, Rufus P., Adams.
White, William M., Canaseraga.
Whitlock, Benjamin M., West Farms.*
Whitney, Cheney P., Orleans.
Whitney, George J., Rochester.*
Whitney, James, Horseheads.
Whitney, James W., Rochester.
Whitney, Orla H., Mexico.*
Wier, Henry, Johnsonville.*
Wier, H. C., Sugarloaf.
Wight, R. A., New York.
Wilbur, Royal P., Lowville.
Wilcox, A. F., Manlius.
Wild, W. H., Valatie.
Wilkin, J. W., Goshen.
Willard, G. L., Cold Spring Harbor.
Willard, X. A., Little Falls.*
Willers, Diedrich, Albany.
Willets, Robert, Bayside.
Willets, Samuel, New York.
Williams, J. B., Ithaca.*
Williams, J. E., New York.
Williams, Josiah T., Chappaqua.
Williams, Samuel Lloyd, Perinton.
Wilson, Benton H., Syracuse.
Wilson, Catlin, New York.
Wilson, Charles S., Utica.*
Wilson, James H., Milton.
Wing, John D., New York.
Winne, Jurian, Bethlehem.*
Wolcott, S. G., M. D., Utica.*
Wolfe, John David, New York.*
Wolfe, N. H., New York.
Wood, Almon H., Utica.

Wood, Amos F., Woodville.
Wood, E. D., Utica.
Wood, Frank, Hoosick Falls.
Wood, James, Mount Kisco.
Wood, John E., Middletown.
Wood, Oren S., Montreal.
Wood, W. Anson, Hoosick Falls.*
Woodford, Francis T., Utica.*
Woodruff, Frank[illegible]n, Brooklyn.
Woodward, Jabez S., Lockport.
Woodworth, Augustus P., New York.
Wurtz, Charles Stewart, Philadelphia, Pa.
Wyckoff, S. S., New York.*

Y.

Yelverton, Robert, New York.
Young, George, Utica.
Youmans, William, Delhi.

Z.

Zborowski, Martin, Morrisania.*

The Dairy Interests of the State of New York.

Paper read before the Society, January 16, 1884,
By JOSIAH SHULL,
Secretary New York State Dairymen's Association.

There is no State in the United States in which the dairy forms so large a part of its agricultural wealth as in the State of New York. In comparing the dairy with the other agricultural industries, there is none which compares with it, either in the magnitude of its investments or in the importance of its productions. It is the leading interest in the farming of the State.

In presenting this subject it becomes necessary to appeal to the last enumeration of the census, that we may bring the comparison down to the last reliable date.

The amount and value of the dairy products in the United States, as by the census returns, we find reported in the year 1879: Pounds of butter, 806,672,071; pounds of cheese, 243,157,850. Estimating the butter at twenty-five cents a pound, and the cheese at eleven cents a pound, we find the value of butter, $201,668,018; value of cheese, $26,747,363. We here find the value of the butter and cheese in the United States $228,415,381.

In the enumeration the number of pounds of butter and cheese manufactured in the State of New York in 1879 was, pounds of butter, 120,878,201; pounds of cheese, 129,163,714. Estimating the butter, as before, at twenty-five cents a pound, and the cheese at eleven cents a pound, we find the value of butter $30,219,550; value of cheese $14,208,008, making the total value of butter and cheese in the State, in that year, $44,427,558. It will here be seen that the State of New York made nearly one-fifth of all the butter and cheese produced in the United States. The estimated value of all farm products of the United States was $2,213,402,564, and New York's share was $178,025,695. This is about one-twelfth of

the value of all farm products of the country. The amount of cheese was, in the United States, 243,157,850 pounds; New York's share was 129,163,714 pounds. From this it will be seen that the State of New York made more than one-half of all the cheese made in the country. The value of all farm products of the State was $178,025,695. From these data we find the value of the butter and cheese to be nearly one-fourth of all the agricultural products of the State.

The number of cows in the State at the time of the last enumeration was 1,437,851. Since that time the dairy business has rapidly increased, so that, at the lowest estimate, the number of cows at this date is 1,500,000. Increase the value of the butter and cheese with the increased number of cows, and we get the value of the butter and cheese for the year 1883, $46,347,815.

The quantity of milk consumed on the farm, in the villages and cities is about 45,000,000 gallons, or 156,521,740 quarts. At two and one-half cents a quart it will amount to $3,913,043, which, added to the $46,347,815, makes the aggregate value of the milk product of the State $50,260,858.

It is ascertained that the quantity of milk and cream received in the cities of New York and Brooklyn, in the year 1883, was 133,350,000 quarts. At two and one-half cents a quart this amounts to $3,333,750, or nearly seven-eighths of all the milk consumed in the State. This would indicate that the quantity of milk consumed in families, on the farms, in villages and in cities has been underestimated. I think we can safely say that the quantity of milk consumed outside of the cities of New York and Brooklyn is at least twice the quantity consumed in these two cities. Presuming that there is twice as much milk consumed outside of these two cities as there is in them (133,350,000 quarts), then we have 400,050,000 quarts consumed in the State, and a value of $10,001,250; which added to the value of the butter and cheese, $46,347,815, we have as the aggregate value of the milk product of the State, $56,349,065. I think we can justly concede the latter estimate nearer correct.

The quantity of land required to support the cows comprises about one-fourth of all the improved lands of the State. From these data we find that three acres of land is required for the support of one cow one year. At this rate the 1,500,000 cows now kept in the State require 4,500,000 acres of land for their support,

which is a small fraction more than one-fourth of all the improved lands of the State.

The total quantity of improved land in the State is 17,717,802 acres; and the total value of farms is $1,056,176,741, this is at the rate of $59.61 per acre. We here find we have invested in land employed for the dairy 4,500,000 acres at $59.61 per acre, making the total value of land employed $268,245,000.

Taking the number of cows, 1,500,000, and estimating them at $33.50 each, and we have the value of cows, $50,250,000.

We find the value of farm implements and machinery in the State reported at $42,592,741. Having ascertained that one-fourth of the improved land of the State is employed in the dairy, we find the value of the implements and machinery thus employed to be $10,648,185.

In summarizing, we find employed in the dairy in the State quantities and values as follows:

Land, in acres, 4,500,000; land value, $268,245,000; number of cows, 1,500,000; cows value, $50,250,000; implements and machinery, $42,502,741 — one-fourth, $10,648,185, making the total value employed in the dairy, $329,143,185.

From these computations it will be seen that the value of cows is fixed at $33.50 each. And the value of the product is a fraction of a cent more than $33.50 for each cow for one year.

These figures and estimates include all qualities of land, from the very lowest-priced to the highest-priced in the State. Also include all the features in the management of lands and the dairy. They include farmers who make failures in their business, and those who make a success in their business. We, therefore, here have shown the business, as embraced in all of its varied features.

The prices of the several dairy products of this State have been so stable and uniform for the last four years, that our estimates and calculations present a very correct and reliable statement of the business at this date (1884).

The value of dairy products as a means of human sustenance will continue to be one of the great factors in sustaining human life. Milk from healthy animals, being the only perfect human food, must grow in use as the value of good health is appreciated, and economy in living is studied and practiced. While we raise no food as cheap and valuable as milk, we find none equal to it in perfection of nutrition. Therefore, the reasons are obvious why

the dairy engrosses so large a share of the agriculture of our State, and will continue to increase in value and importance as its qualities are better understood and its products improved.

The business of dairying is a great and complex art, which calls for the most extensive knowledge to prosecute it successfully, and make the products the most available. It has been carried on by traditional rules, gradually adding item to item in the improvement of the products. We feel constrained to note the fact that within the period of twenty years, since the organization of dairymen's associations and the publication of their discussions, more progress has been made in dairy knowledge and science than for all previous time in the history of the world. While the use and value of milk as a food was duly recognized, its proper manipulation to make it of commercial value was but imperfectly known, and was of but very insignificant value compared with other agricultural pursuits. Though the improvements have been slow, yet they have been of a character to add materially to the prosperity of the dairy farmers of the State.

With our lack of knowledge of the natural laws and influences which control the secretion of milk, the breeding and selection of dairy stock, with the view to carry along and preserve the improvements made, calls for the aid of the best science and practical knowledge attainable.

I have thought best not to enter into a detailed presentation of statistics of the dairy interests, but simply present the matter by the use of as few statistics as possible, yet sufficient to show the extent and value of the interest, relatively with the other agricultural interests of the State. To load down with a large array of tabulated statistics would render the subject tedious and less comprehensive. For general details, reference may be had to the detailed reports of the census department.

The White Grub of the May Beetle.

(Lachnosterna fusca.)

Read before the New York State Agricultural Society at the Annual Meeting, January 16, 1884.

By J. A. LINTNER, Ph. D.,
New York State Entomologist.

In former addresses, which I have had the honor of delivering to this society, it has been a great gratification to me that I have been able to tell of the progress made in economic entomology — that science that, through the study of insect lives and insect habits, aims to promote the comfort, welfare, happiness and prosperity of society at large. So marked has been this progress, that I need not at this time dwell upon it, for it must be evident to all who have given the slightest attention to the study. Insect depredations, to an extent elsewhere unknown, imperatively demanded that means should be found for their control. In recognition of the need, and in response to the call, provision, through State aid of the means essential to the study, was made, and those were found who were ready to devote themselves enthusiastically to the work. As the result, we are able to say, that there is to-day, within the reach of our agricultural community, a literature which offers them means for protection from their insect foes, superior to that of any other country of the globe. But, while boasting of this progress, I should fail of giving honor to whom honor is due, if I neglected to recall the fact, that at the very basis of this progress lie the labors of Dr. Asa Fitch, called to his work thirty years ago by the New York State Agricultural Society, and sustained therein for nearly a score of years, through appropriations obtained from the State, through the instrumentality of the Society. True, the labors and writings of Dr. Harris, of Massachussetts, in his studies of insect habits, and of preventive and remedial measures against a few species, initiated economic investigations, and prepared the way for more extended

research; yet comparatively little could be accomplished in so vast a field, until specialists could be summoned to the work, prepared to devote to it their entire time, and their best abilities.

But the progress of which we boast is only great by comparison with the ignorance that formerly prevailed, when directions were given in our agricultural journals "how to destroy *the* cut-worm," * and "how to prevent caterpillar attack." When measured, however, with what remains to be accomplished, the work seems but barely to have been entered upon — so immense is the number of species to be studied, so varied are their habits, and so secretly are many of their depredations conducted. While the last decade has contributed to our literature the life-history of a large number of destructive species, and has enabled us to find their most vulnerable point of attack and the most effectual means of destruction, there still remain several of our more injurious pests, which, as yet, we know not how to control, or how to prevent at times their wresting from us the products of our toil or the objects of our pride.

We need not be ashamed to make this confession. It in no degree invalidates the importance of entomological investigations. It is simply a consequence of the partial investigations thus far made — commenced only by those who have but recently passed off the stage, and continued by a paltry number of successors; for, as I have elsewhere stated, there are not within the 3,000,000 of square miles comprising these United States, more than ten persons who are permitted to devote their entire time to the furtherance of economic entomology. If, by a wise provision, this number could be quintupled, through each one of the several States contributing its quota, what rapid progress might be made through such an increased and diffused coöperation. My experience of thirty years in the study of insects enables me to make the assertion, that *there is not a single insect pest, the depredations of which we can not materially control, whenever its entire life-history becames known to us.*

The exposed habits of the larvæ of most of our Lepidoptera (butterflies and moths), they being external feeders by day upon various plants, shrubs and trees, have made them comparatively easy subjects for study. It is different when we have to deal with

* In the genera of *Agrotis*, *Mamestra*, *Hadena*, and a few others closely allied, over four hundred United States species of moths have been described, the larvæ of most of which, if not all, may be classed as *cut-worms*.

Coleoptera (beetles), where the larval or grub stage is generally concealed. This is why the early stages of so few of our Coleoptera have as yet been discovered and described.

When, in addition to a hidden, subterranean, larval life, we have also in the life-history the perplexing element of a greatly prolonged and unknown larval stage, the problem of how best to deal with our insect foes becomes a difficult one. In the Coleoptera, among the *Elateridæ* and the *Scarabeidæ*, we have two groups which unfortunately are in this category. The life-histories of the *wire-worms* and of the *white grubs* are unknown to us, and even the duration of their larval period has not been definitely ascertained. They are among the more serious pests of the agriculturist, and we do not know how effectually to prevent their depredations. Many experiments have been tried for their control, some of which have been partially successful. Not awaiting more positive and perfectly satisfactory results, it seems proper that there should be furnished the public from time to time such an epitome of what has been ascertained as may permit of its beneficial use.

It is therefore proposed, at the present, to present a summary of our knowledge of the May beetle, *Lachnosterna fusca* (Frohl.).

The larva of this species has, by common usage, received the name of "the white grub." It is not a well-chosen name, since there are several allied forms to which it might be quite as well applied, but it serves, from its general adoption, the purpose of separating it from other insects when we would speak of it. The perfect insect has in like manner been named the May-bug or May-beetle, and the June-bug or June-beetle. As it is a frequent visitor in our houses, where it is attracted to light, nearly every person, doubtless, has made its acquaintance in childhood. It is a thick-bodied insect of an oval form, and of a dark brown color, and measures

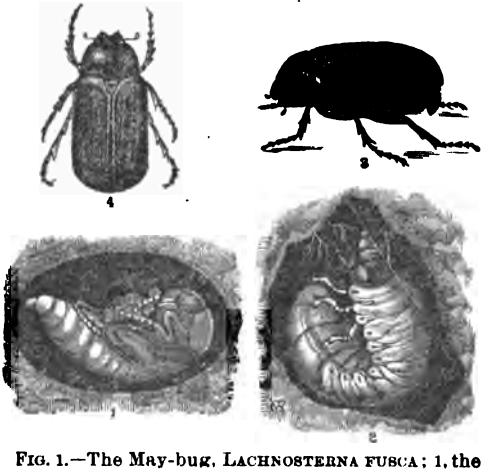


FIG. 1.—The May-bug, LACHNOSTERNA FUSCA: 1, the pupa; 2, the white grub in its ground cell: 3 and 4, the beetle.

about eight-tenths of an inch in length. Its wing-covers are shining and smooth, with the exception of two or three slightly elevated lines on each, and numerous minute impressed dots. The short antennæ terminate in three yellow leaflets or plates. The breast is covered with fine, glossy, yellowish hairs, from which it (together with the other species of the genus) owes the generic name of Lachnosterna, signifying *woolly-breasted.* The legs are tawny yellow, with black upon the joints. In the accompanying figure it is shown in a side and back view in 3 and 4.

THE WHITE GRUB.

The larva may be characterized as a large white, soft grub, with some scattered fine hairs, a flattened, brownish or light mahogany colored head, with six distinct, rather long legs on the front part of the body (the first three rings), and the hinder portion of the body considerably the thickest, as shown in the accompanying figure. When taken from the ground, it usually assumes a curved form, its head and terminal end nearly meeting. When full-grown it is almost the size of a man's little finger. In the preceding figure, at 2, it is represented as lying within a cavity made by it in the ground, while feeding upon the roots of its food-plants.

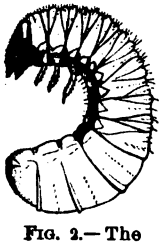


FIG. 2.—The white grub.

There are several other "white grubs," similar to this in general appearance, but as they have habits in common, to a great extent, it is not necessary, except where observations are desired for scientific uses, that they should be readily separable. From a very similar species, however, which occurs in manure, it is important that it may be distinguished, lest proper manuring should be withheld, through fear that the May-bug would be conveyed with it. The May-bug grub does not occur in manure, as its food consists of living vegetable matter.* The grub which is frequently found abundantly in dung-hills, and may be met with under the droppings of cows in fields, is exclusively a dung feeder. It is known in some localities as the "muck-worm." Its scientific designation is *Ligyrus relictus* Say. The following features, by which the two may be separated, have been pointed out by Mr. Walsh. In

[* The grub appears not to be exclusively a vegetable feeder, for it has been observed feeding on the eggs of the Rocky Mountain Locust, *Caloptenus spretus* (Riley, in Rept. Commis. Agricult. for 1883, p. 174).]

the latter species, there may be seen on its back through its semi-transparent skin, along the entire length of the body, a lead-colored line, denoting its intestinal canal filled with the black dung upon which it has fed. In the true white grub, the *L. fusca* larva, it is only near the terminal end of the body that it shows a lead-colored appearance, because it is only at this portion of the canal that the roots upon which it feeds have become digested and converted into a dark-colored excrement (*Practical Entomologist*, i, 1866, p. 60).

THE EGG.

"The eggs are white, translucent, spherical, with an average diameter of 0.09 inch. They are deposited between the roots of grass, and are inclosed in a ball of earth before deposition, as the cavity is sufficiently large for the egg to roll about in." (Riley, Fifth Report, 1873, p. 55.)

It would appear that the above is given from the personal observations of Prof. Riley, or upon reliable information communicated to him. If this be so, then the following statement communicated to the *Country Gentleman*, of August 27, 1874 (p. 547, c. 4), can not be accepted: "Two years ago, I repeatedly saw in a garden the female depositing her eggs while flying — just at dusk — an inch or so above the ground: These eggs were polished white, as large as pigeon-shot, and dropped singly. This is in contradiction to the 'authorities,' for it is stated that the female digs again into the ground and deposits about thirty eggs in one hole" (T. J. Burrill, Champaign, Ill., professor of botany in the Illinois Industrial University).

Beyond the above, I have no knowledge of any publication of observations upon the egg-laying of this species, the construction of the ball of earth in which the eggs are said to be first inclosed, or the manner of its burial. How the ball-making and its burial to a considerable depth, in sod, can be accomplished by the aid of feet so seemingly unfitted for such operations is incomprehensible to me.

INJURIOUS CHARACTER OF THE INSECT.

The May-beetle may with propriety be named among our most injurious pests. It has attained the unenviable notoriety of being pronounced "one of the very worst and most insidious of the farmer's foes." If a list of our insect enemies were arranged in the order of relative importance, this species would, I think, find place among the first twenty. It is a native species, and very early

notices appear of its serious injuries. It was first described nearly one hundred years ago — in 1792. Unfortunately, its depredations are evidently upon the increase, particularly within our own State, as appears from the following extract, and from the numerous inquiries received by me, of late, for approved and effectual means for the arrest of its ravages.

From Washington county, N. Y., in 1881, we have this statement: "The widespread havoc which this insect has caused this year, and the fact that its ravages are increasing with alarming rapidity, is my excuse for referring to the subject. The damages in this county amount to, probably, thousands of dollars annually, and are increasing."

The extent that these depredations have already attained is a sufficient warrant for this present notice of them. In their consideration, those committed in the early stage of the insect — that of the grub — will first be referred to.

INJURIES FROM THE GRUB.

Dr. Harris writes: "They subsist on the tender roots of various plants, committing ravages among these vegetable substances, on some occasions of the most deplorable kind, so as totally to disappoint the well-founded hopes of the husbandman."

To Grass.— Dr. Fitch thus notices it: "These grubs feed upon the roots of grass and other plants, which they cut off a short distance beneath the surface; and when they are numerous they advance under ground like an army, severing the turf as smoothly as though it were cut with a spade, so that it can be raised up in large sheets, and folded over or rolled together like a carpet. Often from a dozen to twenty grubs will be exposed in every square foot when the turf is thus raised. Large patches of this kind will occur in the middle of a meadow or pasture, every blade of the grass being brown and dead" (*3d, 4th and 5th Repts.*, 1859, p. 53).

In some pasture lands near London, Ontario, throughout entire fields "the roots of the grass had been so eaten that the turf could readily be lifted by the hand by the yard, and underneath were thousands of the grubs feeding on the remaining fragments of the roots. In one instance, a field had been so completely destroyed that the farmer had set fire to the withered grass, with the hope of scorching the enemy to death" (*Canadian Entomologist*, xiii, 1881, p. 200).

A report from North Paulet, Vt. (*New England Homestead*, Nov. 8, 1884), states: "There is, at a low estimate, between three hundred and four hundred acres of land in this town that looks as barren as our roads, so far as anything green is visible. In our back lots a good deal of the dry turf has been turned over by skunks, coons, foxes and crows, in search of the grub."

To Corn.— The accounts given of its destructiveness to corn are numerous. Not only does it cut off the young corn when a few inches high, but it will also destroy full-grown corn over entire fields. On Prairie Ronde, in Michigan, it appeared in such numbers as nearly to destroy many fields of corn. Upon examination of a few corn stalks left standing in a field, the roots were found eaten off to within a few inches of the stalk, and often from three to five large grubs in a hill. Most of the corn was killed early in the season, and the few stalks left were dying a lingering death, without producing any grain (*Practical Entomologist*, i, p. 60).

A gentleman from Nine Mile Prairie, Missouri, writes: "They are destroying whole fields of corn. I have seen fields where they have destroyed the corn in patches for rods around, leaving the ground as bare as the traveled road. They seem to destroy the tap-root first, and afterward prey on the laterals" (*Practical Entomologist*, i, p. 61).

From Washington county, N. Y., we have this statement and estimate of injuries to corn from the grub, in the year 1881: "A large area of corn, in the aggregate, has been badly injured or entirely destroyed. On my own farm they caused the loss of one hundred bushels of corn alone; much of it would pull up by the roots when struck by the knife, frequently exposing to view from five to fifteen grubs" (*Country Gentleman for Dec.* 29, 1881, p. 851, c. 3).

Mr. Glover records their extraordinary abundance in Grayson county, Virginia, in 1874, where as many as one hundred and ten were counted in a single hill. They were also, during the same year, quite destructive to corn crops in Huntington county, Indiana, and in Montgomery county, Missouri (*Report of the Commissioner of Agriculture, for* 1874, p. 129).

To Strawberries.— It has long been known as especially addicted to feeding upon the roots of the strawberry. Prof. Forbes, in his excellent *Address on Insects Affecting the Strawberry*, read before

the Mississippi Valley Horticultural Society, at New Orleans, on February 22, 1883, represents it (page 27 of Author's edition) as "perhaps the most unsatisfactory insect with which the strawberry-grower has to deal, offering the fewest opportunities for effective attack. The roots of the plant are often destroyed by it to a degree to impair seriously the value of the plantation." Mr. B. D. Walsh has written of it that it "is particularly destructive to strawberry beds and is probably one of the chief reasons why this plant will not last more than a few years on the same spot of ground in this country" (*Pract. Ent.*, iii, p. 60). Dr. Packard records its ravages at Salem, Mass., where many plants were killed by its eating the main roots and thus passing from one plant to another (*Third Report Inj. Ins. Mass.*, 1873, p. 6).

To Potatoes.— In Washington county, N. Y., during the year 1881, the grub is charged with having devoured whole fields of potatoes.

Hundreds of bushels were reported as having been made unfit for market, in North Pawlet, Vt., in 1884, by the grubs having eaten holes into them (*New England Homestead, for Nov.* 8, 1884).

To Wheat.— Of its injuries to wheat and other grains, Professor Webster has written: "During autumn there is hardly a field of wheat here in Indiana that does not, to a greater or less extent, show the effects of their voracious appetites. Their method of work in the grain fields seems to be much more erratic than in grass lands, as the many clusters of from two to twenty, or perhaps more, dead plants that have been eaten off below the surface, illustrate. Their work in spring wheat, and oats during spring, is usually less noticeable, and we have never observed the grubs feeding on the roots of spring-sown grain later than the fifteenth of May."

To Barley. — Professor Webster also reports that the larvæ were observed in the University Experiment farm at La Fayette, Ind., cutting off the roots of the full-grown and fully-headed grain. As late as the twenty-eighth of June they were causing whole stocks of the straw to wither and die before the kernels had filled (*Ann. Rept. Comm. Agriculture, for* 1886, p. 575).

INJURIES BY THE BEETLE.

Many of our insect pests are injurious only in their larval stage, except through the evil that they originate in the deposit of their eggs. Of this class are all of the extensive order of Lepidoptera, embracing the butterflies and moths, which, in their winged stage, are unprovided with jaws for biting. Their slender and flexible tubular proboscis, fitted only for imbibing liquids, can not be used for any serious harm — in this particular, unlike the rigid, stouter proboscis of the Hemiptera or bugs, which is capable of inflicting serious and varied injuries. The powerful jaws with which many of the Coleoptera, or beetles, are armed, are often fitted for, and employed as, formidable instruments of offense. The May-beetle while, from the character of its food and a life-period of short duration, it is less injurious than its insatiate and long-lived grub, is still chargeable, as a leaf-eater, with extensive depredations at times upon many of our fruit, forest, and shade trees. Dr. Fitch has written of them as "gathering by night upon the trees and eating the leaves, sometimes in such numbers as to wholly strip the foliage from the choice varieties." Prof. Riley states: "I have known the Lombardy poplar to die, in consequence of the utter denudation they caused; while groves of both pin and post oaks [*Quercus palustris and Q. obtusiloba*] * * * were thoroughly and suddenly denuded by them" (*First Report Ins. Mo.*, p. 157).

Of the fruit trees, the cherry and plum appear to be preferred. It was thought by Mr. Walsh that their swarming upon these trees, as they occasionally do, was not usual, except in the eastern States, as he had not known it to occur in the valley of the Mississippi (*Practical Entomologist*, i, 1866, p. 62). But that they are, at times, quite as abundant in that region appears from the record, that in Cameron, Missouri, "they swarmed during the last of May, 1866, making a noise on the trees like the coming up of a storm of wind and rain" (*American Entomologist*, i, 1868, p. 37). Among other trees, the beetle is recorded as feeding upon the oak, the maple, and the beech.

Mr. W. L. Devereaux, of Wayne Co., N. Y., writing in 1886, states: "The May-beetle is very abundant in this county this year, and it has completely stripped the foliage from most of the late infoliating trees like the species of walnut, ash, and oak (*The Husbandman for June* 23).

ABUNDANCE OF THE BEETLE.

The immense numbers in which the insects sometimes congregate in seasons of their unusual abundance is so well known that two notices only will be given of such gatherings. A correspondent from Central Maryland has sent me the following paragraph:

The land seems to be full of them. They lie quiet during the day, but in the night, in the neighborhood and around and among the branches of two weeping willow trees near my house they make a continuous humming noise with their wings, and after the sultry evenings the noise made by them is a continuous roar all through the night.

In the *Rural New Yorker*, of July 10, 1886, is the following notice of an extraordinary flight of the beetles:

An immense swarm of June-bugs settled down on Pekin, Illinois, Monday evening. Millions of them flew against an electric light on a street corner, and were burned to death. Five wagon loads were gathered up afterwards from the ground beneath the lights, and thrown into the Illinois river.

LIFE-HISTORY.

When I say that the life-history of this insect is not known, I offer the best reason for our inability to give effectual means for preventing the heavy annual losses that it inflicts upon us. The brief outlines of a history that are to be found in our entomological reports appear to have no better foundation than a presumed agreement with that of the European cockchafer, *Melolontha vulgaris*— a very poor basis, it may be remarked, for, long as that notorious pest has been known and studied, the knowledge of its transformations is far from complete. Dr. Harris gives no details, but contents himself with the very broad statement that "the habits and transformations of the common cockchafer of Europe * * * will serve to exemplify those of the other insects of this family." Even so accurate an observer as Dr. Fitch, thoughtlessly and unwisely, we think, committed himself to the following statement: "Every thing known respecting the history of our May-beetle and its transformations concurs to show that it is exactly analogous to the cockchafer or May-bug of Europe." In truth, the European cockchafer, of whose excessive abundance and ravages at times we have had such graphic accounts, is not closely allied to our May-bug. It belongs to another genus — *Melolontha* — which is entirely unrepresented in this country.

Professor Riley presents the following history, unaccompanied with the authority or observations supporting it: "Soon after pairing, the female beetle creeps into the earth, especially wherever the soil is loose and rough, and after depositing her eggs, to the number of forty or fifty, dies. These hatch in the course of a month, and, the grubs, growing slowly, do not attain full size until the early spring of the third year, when they construct an ovoid chamber, lined with a gelatinous fluid, change into the pupæ [shown in the accompanying figure], and soon after into beetles. These last are at first white, and all the parts soft, as in the pupa, and they frequently remain in the earth for weeks at a time, until thoroughly hardened, and then, on some favorable night in May, they rise in swarms and fill the air. It is very probable that under favorable conditions some of the grubs become pupæ, and even beetles, the fall subsequent to their second spring; but growing torpid on approach of winter, remain in this state in the earth, and do not quit it any sooner than those transformed in the spring. On this hypothesis, their being occasionally turned up in the fresh beetle state at fall ploughing, becomes intelligible" (*First Report Ins. Mo.*, p. 157).

FIG. 3.—The pupa of the May-beetle.

In all thus far written of the transformations of this insect, the element of uncertainty largely prevails. It does not appear that the larval life-duration has in a single instance been ascertained, and many such determinations would be required in order to establish a rule of uniformity or the range of variation. Observations sufficiently reliable for use in building up a life-history are almost wholly wanting. The following are of some value:

In Clinton county, Missouri, the beetles swarmed late in May of 1866, from which eggs were doubtless deposited in June (the female *is said* to live for about a week). The grubs [from these eggs] were small, and not very injurious in 1867. They were "full-grown, fine, fat fellows," in the autumn of 1868 (*American Entomologist*, i, 1868, p. 37). From the above we educe: If the larvæ were then as reported, full-grown, the beetles from them would appear in May of 1869, three years from their preceding appearance. The grubs may have either transformed into pupæ in the autumn of 1868 or spring of 1869—in the third year of their life. Their larval period would then have been either two and one-third or two and three-fourths years.

Dr. Packard records his having found the pupæ "in little rude cells or chambers, about six inches under the mould * * * in Maine, late in May" (*3d Report Ins. Mass.*, 1873, p. 7).

I will here quote, from its obscure resting place, where it seems to have been overlooked, a somewhat circumstantial history of the transformations of this insect, which from the absence of technicalities and its general character, would seem to be the personal observations of the writer, and, therefore, of considerable value. It is from the *Patent Office Report* for the year 1852, Pt. ii, *Agriculture* (p. 219), and is a portion of a report upon the crops of Ulster county, N. Y., made by David L. Bernard, of Clintondale.

Corn is extensively cultivated in this county, and is considered most remunerative at present. It seldom fails with us to produce a fair yield, except in seasons when the *larvæ* of a beetle are present with us. When these *grubs* prevail to a considerable extent, neither good husbandry nor high manuring can secure us a crop; and perhaps no other county has for the past twenty years suffered more loss from this, than Ulster. This formidable enemy to agriculture seems gradually to be leaving us, in all probability to appear in some other place, and there to renew the same destructive process practiced on us. In order to give this *beetle* a slight introduction to whom it may concern, I will give a brief description of its general appearance and habits. The bug or beetle is about three-fourths of an inch in length, of a dark brown color, and may be seen in large numbers flying through the air, in the early part of the evening, about the last of April or first of May. They deposit their eggs generally in the month of June, on grass land, on soil that is light or loamy. The larva is hatched from the egg during the month of August, and feeds upon the roots of vegetables until the ground becomes frozen; it then descends below the frost, and there remains in a state of torpidity until the following spring. As the frost leaves the ground it ascends to the surface (exhibiting no increase of growth during the winter), and again resumes its former mode of living, carefully secluded from the rays of the sun; feeding on the roots of almost all kinds of grasses and vegetables. Its movements are slow and sluggish; its color nearly white, with the exception of the head, which is red; it has six legs, three on each side; it is at this age about one inch in length. It continues its destruction of all green vegetable matter with which it may come in contact, until the ground becomes frozen again. This is its most destructive season through its progress of change. As the ground becomes frozen, it again descends below the frost (in some instances six feet below the surface), as before remains torpid until the next spring, when it again appears at the surface, being now about one and one-quarter inch in length. It continues to feed as usual upon vegetable substances

until about the middle of June, when it ceases to feed, descends deeper into the earth, and becomes torpid until about the middle of August, when a complete change occurs. It opens lengthwise from the head, back near one-half its length, and forthwith appears in the chrysalis state, in which it remains nearly inactive until about the last of September, when it changes into a perfect state or beetle, and still remains in a nearly torpid state until the following spring, when, about the last of April, it ascends to the surface and immediately commences to reproduce its species.

It has thus far baffled the ingenuity of man to prevent its ravages, while fields of timothy have, within a few weeks, been entirely destroyed by this grub, and thousands of acres of corn have been totally lost in this county by its ravages.

According to the above statement, the larval stage proper would be of the duration of *two years.*

DISTRIBUTION.

This insect is one of very extensive distribution, being found in all parts of the United States, and extending northward into British America, where it occurred in Kirby's collections in north latitude 54° — the latitude of Labrador and Hudson's bay.

ITS ENEMIES.

An excellent reason for the amount of injury which this insect imposes upon us is found in the few insect or other enemies that prey upon it, protected as it is by its subterranean life in its first three stages, and its unusually brief final stage. Only one insect parasite is known to attack it. It has, however, several vertebrate enemies which render good service in restraining its unlimited increase; these will first be noticed:

The Skunk.— There is abundant testimony of the service rendered by skunks in the destruction of the grubs, and to the expertness which they manifest in the discovery of their presence, and in making them their prey. It has been thought that one reason among others for the multiplication of the grub in localities in the Western States and elsewhere is to be found in the wholesale slaughter of the skunk since their skins have obtained commercial value as a fur. In the *Country Gentleman* of December 1, 1881 (p. 778, col. 2), we have the following observations: "A few years ago, before skunk skins became so valuable as furs, I had a pair of half-tamed skunks which I used to let out every evening to dig for grubs, and it was wonderfully interesting to see their infallible

scent or instinct in discovering the location, and then their astonishing celerity in digging out and gobbling the grubs. But most astonishing of all was the quantity of grubs those two little beasts would devour every evening. I have often watched them, and, incredible as it may seem, I could not say that they ate less than half a bushel daily!" To the above statement, the suggestion is added, that a very valuable ally might be obtained in our war against the white grub by removing the odoriferous glands from the skunk, and domesticating him for employment as a grub killer.

Mr. Hoard, of Wisconsin, has made the following statement: I once had eight acres of hops, in which the white grub was very destructive. I went through the hops one morning, when there had been a couple of skunks in the hops in the night, and I found by actual count that they had investigated 400 hop hills, and I thenceforth became a very firm friend of the skunk (*Trans. Wisc. St. Agricul. Soc.*, xix, 1881, p. 298).

A correspondent of the *Practical Farmer* had watched the habits of skunks for twenty years, and found their natural food to be insects. He had a field of corn attacked by the white grub, in which he afterwards observed numerous small, round holes where these insects had been taken out by the skunks and devoured. He believed that the skunk should stand first in the list of insect destroyers, as it fed upon other noxious insects in addition to the white grub (*Country Gentleman for Jan.* 25, 1877, p. 527).

A correspondent from Washington county, N. Y., gives this testimony: "Before skunks began to be hunted, we had no trouble with the white grub, and I think they kept them down. I often found my corn-hills rooted into, evidently by skunks in search of grubs. Those dug into early in the season made a fair crop, while those untouched until later were destroyed. I have also seen the same signs in meadows and pastures" (*Country Gentleman*, Dec. 29, 1881, p. 851).

Not only are the grubs so eagerly sought for and devoured by this animal, but it is also, according to Dr. Fitch, a natural destroyer of the beetle, its food consisting almost entirely of this insect during the short period of its existence (*Third Fitch Rept. Ins. N. Y.*, p. 55). This is in accordance with the statement of Dr. Harris, to the effect that the beetles are devoured by the skunk, whose beneficial foraging is detected in our gardens by its abundant excrement filled with the wing-cases of these insects.

The Raccoon.— Dr. Thomas (*Sixth Rept. Ins. Ill.*, p. 98) names the raccoon as one of the carnivorous animals that prey upon this insect, but does not state to what extent it destroys it.

In the report from North Pawlet, Vt., page 11, it is mentioned as one of the animals that had been digging in the dry turf for the grubs that had caused the death of the grass.

The Fox.— In the same report, this animal is also included among those which had been rendering good service to the farmer, and the following suggestion is added: "There is now a bill before the Legislature authorizing the State to pay one dollar a head for all foxes killed in the State. Now, if these grubs continue with their sad havoc from year to year, I should think it a wise legislative act to pass a law prohibiting the killing of all wild beasts and birds which subsist in part on these grubs."

The Mole.—Professor Claypole, a careful observer of the habits of insects and other animals, permits us to claim the mole as an auxiliary in our warfare against the white grub. The following is what he saw, writing from Yellow Springs, Ohio: "In digging potatoes this year, I observed the runs of a mole in all directions through the ground. It was a piece of old sod, and very much infested with white worms, the larva of the cockchafer, *Lachnosterna fusca*. Many of the potatoes had been partly eaten by these worms, but I observed that wherever a mole-run traversed a hill of potatoes no white worm could be found, even though the half-eaten potatoes were proof of his former presence. The inference is fair that the mole had found him first and eaten him, and very likely the mole's object in so thickly tunneling this piece of ground was to find these grubs" (*Canadian Entomologist*, xiv, p. 17).

A writer in the *Indiana Farmer* says: "Last year I put twelve moles in my strawberry patch of five acres to catch the grubs, and they did the work. I never had a dozen plants injured during the summer, either by the grubs or moles. I know some people do not care for moles on their farms, but I want them in my strawberry patch."

The Gopher.— In Michigan, upon some new land badly infested with white grubs, and where the gopher was also abundant, the attempt was made to exterminate these animals, until they were observed, in the autumn, busily engaged in digging up and eating the grubs.

The Frog.—This animal undoubtedly destroys large numbers of the beetle, at the time when their destruction would be of the greatest benefit, during the night of their emerging from the ground and before they have deposited their eggs. Dr. Hoy, of Racine, Wis., relates that on the twelfth of June, having occasion to go across a little piece of prairie, he saw a large spotted frog, *Rana* ——, very large and hardly able to jump. He captured and opened him, and to his surprise found within him eight May-beetles. Others were caught and examined, and each was found to contain from one to four of the beetles (*Trans. Wisc. St. Agricul. Soc.*, xix, 1881, p. 297).

Other Mammals.— Among the mammals appointed to check the ravages of the cockchafer and allied leaf-beetles in Europe, according to Latreille, are the badger, weasel, marten, bats, and rats. The same animals, no doubt, render more or less service in restricting the increase of the May-bug in this country.

Domestic Fowls.— If these be watched as they follow the plow in our gardens and fields in search of such insects as may be brought to the surface, it will be seen that they show a special fondness for the white grub. Their presence during the operation of plowing should, therefore, always be encouraged.

The Crow.— The common crow feeds upon both the beetle and the grub. It is believed by many that its frequent occurrence in corn-fields is the result of its fondness for the grub, which is preying upon the young corn, rather than for the corn itself. The studies that have been so ably conducted during the last few years upon the food of birds should have settled ere this the question beyond all doubt, whether the crow is to be driven from, or invited to, our corn-fields.

Mr. Glover states that this bird has been observed to return on the appearance of the dor bug or May-beetle, and to feed greedily upon it both in its winged and larval stages.

Other Birds.— The beetles have been found in the stomach of the king-bird, *Tyrannus Carolinensis*, shot in the month of May. The robin, black-birds and jays are also said to feed upon them.

The grub has been taken from the stomach of the sparrow hawk, *Falco sparverius.*

Insects.— The grub has also enemies among its own class, which prey upon it. Several of the predaceous beetles are said to

devour it — species of the rapacious *Carabidæ*, probably *Calosoma calidum* and others, but their names have not been recorded.

A Parasite.— While many insect attacks are restrained through the beneficent aid of other insects, which, in our gratitude, we are apt to regard as specially commissioned to perform this duty for our protection, thus far we know of but a single parasite which is waging warfare upon the white grub. This insect was described and figured by Professor Riley, in his *Sixth Report on the Insects of Missouri* (1874, pp. 123, 124), as the white grub parasite — *Tiphia inornata.* It is shown at *a* in the accompanying figure. It is one of the digger-wasps, and the ease with which these creatures are able to burrow in the ground enables this one to discover the grub in its concealed retreats, and by depositing an egg upon the body, to provide for its progeny its needed food, and to insure the death of the attacked grub. The parasitic larva, shown at *c*, having matured, it incloses itself for its changes in "an egg-shaped cocoon of a pale golden-brown or buff color, and with a soft exterior surface, in touch as well as color. * * * Upon cutting this cocoon open, it will be found to consist of about a dozen delicate layers, the outer ones soft and loosely spun, the inner ones more and more compact and paler in color." The cocoon is shown at *d* in the figure. Their presence in the ground (from the above description and figure they may be easily recognized) serve to show the parasitic attack. They have in some instances been met with in such numbers, in association with a formidable grub attack, as to arrest attention and to induce inquiry into their character.

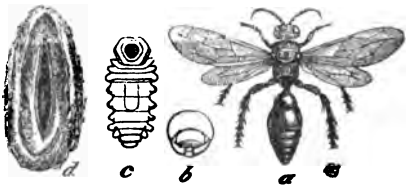


FIG. 4.—The white grub parasite, TIPHIA INORNATA.

For an interesting mention of a secondary parasitic attack — the larva of the *Tiphia*, in its turn and while within its cocoon, is destroyed by a beetle known as *Rhipiphorus (Emmenadia) pectinatus* Fabr., var. *ventralis* — see Riley, *loc. cit.*, p. 125.

From a paper recently read by Mr. Otto Lugger, before the Baltimore Naturalists' Field Club, it appears that the Rhiphophora parasite above mentioned, which destroys the Tiphia parasite, has a parasite which also destroys it. Mr. Lugger had found within the Tiphia cocoons small hymenopterous parasites — the species

not stated—showing this interesting order of events: The larva of a large Coleopterous insect (*Lachnosterna fusca*) is destroyed by a hymenopterous larva (*Tiphia inornata*); this in turn by a Coleopterous larva (*Rhipiphorus pectinatus*); and this again by a Hymenopterous larva (——— ———).

FIG. 5.—The white grub attacked by a fungus.

In connection with the parasitic attack on the white grub, it is of interest to note that Dr. F. Brauer has lately discovered a very interesting parasite upon *Rhizotregus*, an European genus belonging to the same group with *Lachnosterna*. Within its nearly formed pupa, he has found the second larval stage of a dipterous insect, *Hirmoneura obscura*—one of the bee-flies, the genus of which is represented in the United States. It is still not known when and in what manner the parasite enters the Rhizotrogus grub, but it was thought to be while the latter is in the larval state (*Science*, iii, April 18, 1884, p. 488).

The White Grub Fungus.—For another destroyer of the white grub, and the most interesting of all that we have referred to, we have to turn to the vegetable kingdom—to that low class of plants known as *fungi*. From its being so often found upon this species, it has been popularly named *the white grub fungus*. Scientifically, it is known as *Cordyceps Ravenelii* Berkeley.* It was described in 1857, but its economic importance in its association with the white grub was not known until brought to notice by Walsh in 1867 (*Practical Entomologist*, ii, 1867, p. 116) upon the reception of specimens from a large number of the grub killed by this growth, which had been plowed up in a field in Iowa. Its character was not understood at the time, Mr. Walsh suggesting that, but for the numbers found, the grub might have swallowed a seed which subsequently sprouted and grew. Later, its fungoid character was disclosed. Its general appearance is that of a pair of elongated horns, green at first, but subsequently changing to brown, issuing from

* Originally described as a *Cordyceps*, and subsequently referred to other genera, it has recently been restored to the *Cordyceps* of Fries, in *Sylloge Fungorum* of P. A. Saccardo (vol. ii, 1883, p. 573).

the lower side of the larva, between the head and the first joint. In length they vary from less than that of the larva, to three or four times as long. Its appearance, when it has attained the latter length, is shown in Figure 5.

This interesting parasite occurs at times, in considerable abundance, more particularly in the West, and South.* It has been met with occasionally in New York, specimens having been received by me from ex-Governor Seymour, occurring upon his farm near Utica, and from others.

It has been suggested that this fungus attack might be extended, through propagation and distribution of the spores of the fungus, but I am not aware that the experiment has ever been made.

PREVENTIVES AND REMEDIES.

Passing now to the more practical portion of this paper, we will consider what may be done to control the ravages of the insect of which we have been speaking, and first, the preventive means that promise protection.

Ashes.—It is stated that for strawberries, which are very liable to attack, an efficient protection is found in placing a quantity of ashes, either leached or unleached, upon the ground, before setting the plants. This is upon the authority of Dr. Barnes, of Owasso, Mich.

Tobacco.—A gentleman from Westwood, N. J., states that by digging [burying] tobacco stems into strawberry beds, the injury of the grub may be prevented (*Country Gentleman*, Oct 21, 1875 p. 669).

Rolling, etc.—Compacting the surface of the ground by treading it with sheep or cattle, or by the use of heavy rollers, might give protection from the deposit of eggs, by the inability of the beetle (if this be its habit) of excavating the earth for the purpose, and might also serve to prevent the easy passage of the grubs, if in the soil, from one root to another. But this method, which has been urged for use against many insects by English writers, seems so opposed to the condition of looseness and pulverization of the soil which is well known to stimulate vegetable growth, that we incline to the belief that whatever protection it might yield from insect injury would be counterbalanced by a stinted crop.

* Mr. Wm. Trelease has found it proving very destructive to white grubs in the neighborhood of Madison, Wis. (*Psyche*, iii, 1881, p. 279).

Gas-lime.— Although not tested by experiment, I have great faith in the efficacy of gas-lime, as a protection from the deposit of the eggs of the beetle, or, if the protection be but partial, then, for the destruction of such eggs as may have been deposited. Upon ground to be seeded or planted, the lime, fresh from the works, might be distributed and worked into the soil, but where the crop to be protected is already upon the ground, the lime should first undergo such atmospheric exposure as would permit of its use as a top-dressing without harm to the vegetation. It should be applied during the month of May or June, or as soon as the beetles are seen upon the wing. For different methods of its application I would refer to my First Annual Report, where I have treated at some length of gas-lime as an insecticide.

In referring to this preventive, Miss Ormerod has written: "Gas-lime has been tried, sprinkled broadcast, without keeping off the chafers, but if it was shoveled on in a thin layer, so that the chafers could have no cognizance by any natural instinct of what was beneath, and also could not penetrate into the soil without first fairly scuffling their way through the gas-lime, one might hope for good results. It would be well worth while to try whether shoveling ashes or dry earth, well sprinkled with spirits of tar, or with phenol, might not be of great service; or again, mulching over the roots with any suitable material that could be moistened from time to time with soft (or whale oil) soap (*Agricultural Students' Gazette* [Cirencester, England], April, 1883, i, p. 73).

Air-slacked Lime.— There is good reason to believe, from the many statements that have been made, that the foliage of trees threatened by destruction from the beetle, may be saved by a thorough dusting of air-slacked lime above and below, as far as possible, while damp with the dew — better if done in the morning. The pests dislike gritty food, which is apparently repulsive to them, and while the greater part of the caustic quality of the lime thus slacked is gone through the slacking, yet doubtless there is enough remaining to make the taste of it obnoxious.

According to the *Livermore* (Cal.) *Herald*, Mr. Julius Schrader, who owns a fine vineyard and orchard west of that town, saved his crop of apricots from the attack of June bugs by the use of air-slacked lime. His trees were swarming with the insects, which had begun to destroy the fruit as fast as it ripened. He applied the lime by dusting it through the trees, with the result of driving

away every insect, and saving the remainder of the crop uninjured. (D. W. Coquillet, in the *Pacific Fruit Grower*, i, September, 1887, p. 132).

Infusion of Burdock Leaves.— A correspondent of the *New England Homestead* gave the following as an effectual remedy for an attack of the onion maggot:

Take green burdock leaves and stalks, run them through a hay-cutter, put them in a large kettle or tub, and mash them with an old axe or mall, adding water, and pounding them to a pulp. Let it stand over night, have the decoction strong, and when you see the first sign of the maggot, use this, and it will be found a dead shot for the worm. Put it on all of the onions as a preventive. I have used it for forty years on onions. I use a sprinkler, taking off the nozzle, and pouring the solution along the rows. I seldom have to apply it the second time.

If the above was what it claimed to be—an effectual preventive of the attack of the persistent onion maggot, which no application hitherto had served to repel—it seemed that it should be equally efficient if used to prevent attack of the white grub. A test of its efficacy was, therefore, suggested to Professor C. H. Peck, who had applied to me for aid against the ravages of the white grubs in his garden. The results of its use by him were so entirely satisfactory, that a communication, in which they are detailed, made to the *Country Gentleman* of November 25, 1886, p. 893, c. 4, is herewith given:

EDITORS COUNTRY GENTLEMAN.— In April last the writer moved into the country, and started a garden. In one part of it, 300 strawberry plants were set. The ground had previously been in grass, and was well stocked with the white grub—the larva of the troublesome May-beetle, *Lachnosterna fusca*. Any experienced strawberry-grower would probably say that it was a foolish operation to set strawberry plants in such land, but as no other was available, the risk was taken, and the difficulties encountered. No sooner had the plants fairly commenced growing than they began to die, one after another. The withered and drying plants were found to be nearly rootless, and, in most instances, the white grub that had eaten the roots was found in the ground under the plants.

As a first attempt to stop the destruction, the earth between the rows of plants was dug over, and the grubs thus found (about forty) were killed. But all were not found. The destruction still went on, though perhaps less rapidly than before. Wetting the ground about some of the plants with chamber slops was tried, but proved ineffectual. At the suggestion of the State Entomologist, Prof. J. A. Lintner, the burdock remedy, which has been

reported as effectual against the root maggots of the onion and cabbage, was tried. A bundle of burdock plants was gathered, cut and pounded according to directions, and soaked in water over night. With this infusion a dozen or more of the strawberry plants in different parts of the patch were watered. Under two of them, as special-test plants, living grubs were placed, that they might be in a convenient position to eat the burdock-watered roots, if they were so disposed. But they did not eat them, nor to this day have any of the plants thus treated at that time been attacked. After the lapse of about two weeks, wishing to see if the remedy was still effectual, another live grub was placed in the soil, at the roots of one of the special-test plants; but he, like his predecessors, declined the proffered roots. In the meantime, the untreated plants were dying, one after another, from the loss of their roots, till now nearly half the number have been destroyed.

But the experiment already tried had given me such confidence in the burdock remedy that the vacant places in the patch were filled with new plants, and these, together with the untreated older ones, were given a dose of burdock water. This put an end to the attacks of the white grub for at least six weeks. Then two of the late-set plants suddenly wilted, and were found to have their roots partly eaten. With this exception, no treated plants have been lost to this day. I am unable to explain the failure in the case of these two plants. Possibly they may not have received so thorough a wetting as the other plants. Notwithstanding their loss, my confidence in the ability of the burdock remedy to protect the strawberry plant against the white grub is unshaken. It may possibly be necessary to apply it twice in a season, but with the exception of these two plants, one application has been sufficient in this case. It does not appear to be at all detrimental to the growth or vigor of the plant.

We may pass now to remedial measures, and first those referring to the destruction of the beetle.

Tree-shaking.— The May-beetle has a habit in common with many other species of becoming gregarious, in times of its great abundance, when it assembles in multitudes for the night upon fruit trees. This habit permits of its destruction in large numbers, and the reduction of the following brood to the extent that its eggs have not at this time been deposited, by shaking them from the trees upon sheets spread underneath. Dr. Harris records, that in this way two pailfuls of beetles were collected on the first evening of the experiment — the number decreasing upon following evenings until the fifth, when only two beetles were to be found. He adds: "The best time, however, for shaking the trees * * * is in the morning, when the insects do

not attempt to fly. They are most easily collected in a cloth spread under the trees to receive them when they fall, after which they should be thrown into boiling water to kill them, and may then be given as food to swine" (*Treat. Ins. Inj. Veg.*, 1862, p. 31).

Dr. Fitch, in referring to this remedy, gives the time in which the trees may be shaken with the best results, as between midnight and daylight, as would appear from the observations of Mr. Milo Ingalsbe, of South Hartford, Washington county, N. Y. "He had seventy plum trees and a number of cherry trees of the choicest varieties, which never gave fairer promise of an abundant yield than at that time. But a swarm of these May-beetles suddenly gathered upon the trees, many of them being then splendidly in bloom, and in two nights, the fifteenth and sixteenth of May, wholly stripped them of their foliage, so that many of them were as naked as in winter. With their humming notes, these beetles were flying about the trees every evening until about 10 o'clock, when they would settle in clusters of eight, ten, twenty or more, and would thus remain until daylight, when they would tumble down from the trees, flying but little, however, and hiding themselves wherever convenient to stay through the day (*Third Fitch Rept. Ins. N. Y.*, 1859, p. 54).

Attracting to Light.—The beetles, in their evening flights, are readily attracted to light, as is shown in the frequency with which they fly in at the open windows of our dwellings, public halls, churches, etc., in warm evenings, and the numbers that may be seen circling about the electric lights of our streets, or lying upon the pavements beneath, to which they have fallen. This well-known propensity of the beetle may be utilized to lure them to their destruction. If a lantern be placed above a vessel of water upon which two or three tablespoonfuls of kerosene has been poured, many of the beetles drawn to the light and striking against it will be thrown into the water and killed. Many other noxious insects may at the same time be killed by this method.

In our efforts to destroy the *larva*, we are met with several difficulties, of which these may be given:

1. Applications to the ground of sufficient strength to invariably kill the grub, of which several might be mentioned, would also be destructive to a growing crop.

2. The strongest applications that may with safety be applied, would be so impaired in strength in entering and penetrating the ground as to become inefficient at a moderate depth.*

3. The grub has the ability of withdrawing itself from the obnoxious application by burying itself deeper in the ground.

In consideration of the above and like difficulties, effort should be directed toward the discovery of some substance which will act upon the grub through other means than its exceeding strength. Should it be of such a character as simply to be repulsive to its taste, there is reason to believe that, rather than to feed upon roots that are saturated with it, it would die of starvation. In this manner, perhaps, may be found the reputed efficacy of the burdock infusion and of the application next to be noticed. Experiments in this direction are very desirable.

Salt.— The application of salt has been pronounced an effectual remedy, while it has also been said to be of no avail whatever. The remedy would be so simple, and withal so inexpensive, that the claim made for it should be tested by careful experiments. It is possible that the reputed success may have resulted from its employment in the year of the greatest ravages — that preceding the transformation to the beetle, for during this latter year (next after the application), the newly-hatched grub will have made so little progress in its growth that there would necessarily be a comparative immunity from its injury. On the other hand, the ascribed failure may have followed a too economical use of the cheap material — perhaps through fear of injury to the crop. A gentleman who strongly recommends this remedy, presumably from having thoroughly tested its value, deems it essential that the salt should be used in large quantity. He writes: "The great error with those who have used it with unsatisfactory results has been its scanty application. I can assure the reader that grass or potatoes will grow luxuriantly under an application of *one ton and a half per acre*, which quantity would be sure to result in the complete extermination, not only of the grub, but every other kind of worm, and prevent the scab and other excres-

* Some of the Lachnosterna grubs ordinarily feed at a considerable depth. Thus the larvæ of *Polyphylla decemlineata* Say, has been found by Mr. Rivers at a depth of from one foot to two feet among the root-fibers of a coarse grass and roots of a Californian laurel, *Umbellularia Californica* (*Bull. Cala. Acad. Sci.*, 1886, ii, p. 69).

cences which sometimes appear on potatoes, as well as preventing rot. A less quantity, say half [three-fourths of a ton], or even two or three barrels to the acre, though of course not as effectual, will accomplish much" (*Country Gentleman, for Aug.* 3, 1882, p. 601, c. 2).

If the above testimony to the value of salt as a grub-killer shall be sustained by further experiment, I would strongly urge, in view of the periodic character of these attacks in localities, that the salt be applied *in the year of the abundant appearance* of the beetle, and preferably during the month of August or September, although no injury from the grub may be apparent. At this time the young grubs which are produced from the eggs deposited in June are within reach of the application, and may be killed far more readily than when they have attained additional powers of resistance in another year's growth.

Caustic Lime wash.— Mr. Daniel Batchelor, of Utica, N. Y., in a paper on "Lawns and Lawn Grasses," read before the Western New York Horticultural Society, at its annual meeting in January, 1885, in referring to the destructiveness of the white grub to the roots of grasses, states:

Its presence is made known by the appearance, in patches, of dead and bleaching grasses, and then is the time to attack the depredator. My method has been to pierce the sod with a steel bar to the depth of about six inches, and to make the perforations the same distance apart. Into these holes I pour caustic lime wash from the spout of a watering pot, and the pulpy fellow is done for. After the lapse of a few days the denuded surface is thoroughly raked, and some lawn seed sown.

Rooting out by Swine.— The value of swine in freeing infested grass lands from the grub has often been urged, and we think is not overestimated. I believe that this remedy will prove successful, if good rooters be employed, when other methods fail. Dr. Fitch has written of it:

"I would recommend the placing of a temporary fence around that portion of the meadow or pasture which is so thronged with these grubs, thus for a while converting the patch into a hog pasture. The propensity of these animals for rooting and tearing up the turf, we are all aware, is for the very purpose of coming at and feeding upon the grubs and worms that are lurking therein; and who knows but that this rooting propensity, which has all along been complained of as being the most vicious and troublesome habit

which belongs to swine, may after all turn out to be the most valuable and necessary to us of any of the habits with which they are endowed. I can not but think that these animals, confined upon a spot so overstocked with grubs, would in a short time ferret out and devour every one of them, leaving the soil cleansed, mellowed, manured and well prepared for being immediately laid down to grass again, or for receiving any other rotation of crops for which the proprietor may deem the spot best adapted."

Mr. Walsh, formerly State Entomologist of Illinois, had equally strong faith in the value of this method of overcoming the white-grub attack. After discoursing upon the great increase in the insect as observed in a few preceding years, its growing injury to young nurseries, and its violent irruption upon corn, which had formerly been exempt from it, he adds: "I suspect that the above phenomena are to be wholly or partially attributed to the introduction of improved breeds of hogs in the place of the old, slab-sided, long-nosed prairie-rooters, and to the passage of laws compelling people to keep their hogs under fence, instead of allowing them to run at large. * * * Within the last few years such laws have been very generally passed in the Western States. * * * Hence, I am inclined to infer that the presence of the white grub is often to be attributed to the absence of the hog."

Digging out.—When a valuable crop has been found, too late for other remedies, to be suffering from a severe attack of the grub, threatening its entire destruction, it has been saved by digging out the grubs by hand—popularly known as grubbing. In a pamphlet recently published by Mr. R. C. Haldane, upon the "Coffee Grub in Ceylon," the writer, in the discussion of several methods, states:

"When coffee is thoroughly attacked, I know of but one cure—*dig out the grub.* It is slow, weary work, but it pays. I gave my men small dagger-shaped wooden pegs, and a cocoanut shell. Another man brought a bucket round into which he emptied the shells, and then took the collected grubs and put them in a five-gallon drum of boiling water." By the above method from 100 to 150 grubs could be collected at each bush, and in one season (1882) twelve tons of coffee grubs were picked from a field, in Lindula, of eighty acres."

Without occupying your time in a review and discussion of various other methods that have been proposed for destroying the

grub, I will refer to but one other, which I regard as an effectual one, wherever it may be resorted to:

Starvation.— As soon as the attack is discovered, upon the removal of the crop, collect and burn, as far as practicable, all the vegetable material upon which the larvæ could feed. If the ground has been cultivated for vegetables, gather all the stalks, stems, vines, etc., together with the roots, in piles, and burn them. If the land be in grass, after feeding as closely as possible, plow thoroughly, and follow during the autumn with such additional plowings and harrowings as shall best tend to destroy all vegetable life. At this time, gas-lime, if procurable, should be applied. Repeat these operations in the following spring, and allow the land to lie fallow for the year. Compliance with these directions would not only starve out the white grub, but also whatever wire-worms, cut-worms, and other underground larvæ there might be present.

The fallowing of the land for an entire year may be found to be unnecessary. It is not improbable that it might be preferable that the thorough breaking up of the ground in the autumn and spring be followed with a crop of buckwheat. Wonderful efficacy has been claimed for this plant, in freeing the ground from wire-worms — the larvæ of other beetles, and we know not why it may not be equally efficient when employed against the white grub. By all means, let thorough tests of its value be made, since the trial is so simple. Hon. A. B. Dickenson, after experimenting with salt and lime for destroying wire-worms, has stated: "I have only proved one remedy for the rascals, and that is, to break the sod and sow it to buckwheat; plow late and as often as possible in the fall, and then sow it to peas in the spring; with the like plowing next fall, they will not disturb any crop the next season."

In England, a crop of mustard is regarded as an antidote against the wire-worm. In an address before an agricultural society there, the speaker, after detailing some successful experiments upon a small scale with mustard, stated as follows: "Thus encouraged by these results, I sowed the next year a whole field of forty-two acres, which had never repaid me for nineteen years, in consequence of nearly every crop being destroyed by the wire-worm; and I am warranted in stating that *not a single wire-worm could be found the following year*, and the crop of wheat throughout was superior to any that I had grown for twenty-one years." Certainly

this very successful experiment, confirmed as it is by many others that I find recorded, deserves to be faithfully tested with the white grub.

STUDY OF THE INSECT DESIRED.

I have now given you the characters by which the notorious white grub may be recognized; have narrated so much of its life-history as is known to us; have told you of its ravages and of the enemies that prey upon it; and, so far as I am able, have pointed out the principal means for the prevention of its depredations, indicating those which are deemed the best.

To me, and perhaps to some of my audience, it is not the satisfactory exhibit of knowledge of the species that is desirable. As before stated, there are several points in its history upon which information is still needed. May I ask, and in return be favored with the aid of the members of this society toward supplying what is lacking? You have the opportunities for making valuable contributions with but little effort, and of a kind that may not be obtained from other sources. I would, therefore, beg of those present, and of others who are interested in the eminently practical work in which we are engaged, to make observation and to send me the results from time to time of some of the following points. Even in a communication of two or three lines, quite important information may be contained:

The earliest and the latest appearance of the May-beetle in any year.

The comparative abundance of the beetle in different years, particularly noting such years of unusual abundance, as may appear to indicate a periodicity of three years.

The presence or absence of eggs in the female beetle, to be ascertained by cutting open the abdomen and examining the contents. The female may be told by the three-leaved (when spread apart) terminal club of the antennæ being but about one-half the length of that of the male. My observations tend to the probability that the eggs are deposited before the beetle comes abroad for flight and food. It is important that this point should be determined.

The reëntering the ground by the female for depositing her eggs; the character of the soil entered as to its degree of compactness; and the crop cultivated thereon.

The manner of oviposition, if in a mass within a ball of earth as stated, or singly—the number of eggs, and depth at which placed.

It is thought that this can be ascertained the most easily by taking a few examples of each sex when freshly turned out from the ground while yet in their pale color, and confining them in a box of sod-covered earth, and, after their death, carefully examining the soil for the eggs that may have been deposited. Or the beetles uncovered by the plow in the early spring might be sent to me for this observation.

The effects of gas-tar water, ammoniacal liquid when it can be obtained, guano, phosphates and superphosphates, hog manure, kainit, sludge acid, alkali waste, bisulphide of carbon, etc., employed either as preventive of egg-deposit or for killing the larvæ. Even negative results from the use of any of the above applications should be recorded.

In conclusion, gentlemen, permit me to solicit your aid, not only in the above, but in other observations upon our insect foes, where aid is still needed. I believe that most of you have been led to appreciate the value of the investigations in which I am engaged. Some of you know my devotion to the work, and some of the results attained. It is my aim to make my official labors creditable to the State, and of value to the community at large. The members of the State Agricultural Society, to many of whom I am already under deep obligations, can do very much toward aiding me in my purpose. I beg that they will do so.

[NOTE.—Some additions have been made, in the present republication, to the paper as read before the State Agricultural Society, and originally printed in the Report of the Society for the year 1884.]

Animal Plagues and the Economy of Extinguishing Them.

Address before the Society, January 21, 1885,
By JAMES LAW, F. R. C. V. S.,
Professor of Veterinary Science in Cornell University, and Consulting Veterinarian to the Society.

MR. PRESIDENT AND GENTLEMEN.—The rapid growth of our live-stock industry to its present unprecedented dimensions, and the prospect of its continued increase from its present value of $2,000,000,000, should be excuse enough for once more calling attention to the dangers that threaten us through neglected animal plagues. The need is the more urgent that those great autocrats of our public opinion — the newspapers — have, of late years, in too many cases, ranged themselves against veterinary sanitation, and have aided in securing the neglect of animal plagues, which in such a case means not simply neglect, but a contribution to their advancement.

I can easily grant, what is doubtless correct, that these newspaper writers claim that they are actuated by a desire to favor our live-stock industry by covering up the fact that we have any contagious disease among our flocks and herds. They argue that if we can only keep the people of Europe in the dark as to these outbreaks, they will willingly import our cheap meat for the supply of their teeming millions, and that we shall thus secure a large influx of European gold. But have they ever considered the real effect of such subterfuge on the governments of Europe? These governments have their consuls planted all over our land from Maine to California, ready to report whatever happens in the area embraced in their respective consulates. That they do so report, we can easily assure ourselves by consulting the yearly reports of the veterinary department of the British government or the monthly issues of the *Veterinarian*. I shall quote one or two

statements from the reports of the veterinary department in successive years:

In 1880, it is stated that "several reports have been received from her majesty's consuls in the United States of America, in reference to the prevalence of pleuro-pneumonia in various parts of the country, more particularly in Pennsylvania, Maryland, Connecticut, New York, Long Island, New Jersey, and at Staten Island and Baltimore, and it has been ascertained that many of the cattle which are found to be affected with this disease, on being landed in this country, come from the Western States. Some of the reports refer to the existence of other diseases among cattle in that country, such as Texas fever, black leg and husk. Swine fever still continues to be very prevalent in the States."

In 1881, the report states: "Several reports have been received from the British consuls in the United States of America during 1881, mentioning outbreaks of pleuro-pneumonia as having occurred in New York, New Jersey, Pennsylvania, Delaware and Maryland, also at Long Island, but no reference is made to any outbreaks of foot and mouth disease, although several cargoes of animals, in which that disease was present, were landed in this country. Swine fever or hog-cholera is prevalent in some of the States."

Of 1882, the report says: "Several reports have been received from the British consuls in the United States of America during 1882, mentioning outbreaks of pleuro-pneumonia having occurred in New York, New Jersey, Pennsylvania, Delaware and Maryland, also on Long Island and Staten Island. Swine fever or hog-cholera is prevalent among the States."

In the *Veterinarian* for December, 1884, are reports of lung plague "in Maryland and in Chester county." In the November issue it is stated that "in the United States pleuro-pneumonia has been detected among Jersey-bred cattle in the State of Illinois." Similar reports appear month by month in the columns of that journal.

Nor is this all. It must be within the knowledge of many, that whenever a doubt arises as to the existence of one of these plagues in our flocks or herds, the mother country at once instigates her dependency of Canada to send a veterinarian on a tour of inspection to resolve the doubt. I need only instance the missions of Professor McEachran to New York, Philadelphia and Washington in 1878; to Portland, Me., in 1883, and to Kansas in 1884; also

the visits of several Canadian veterinarians to Illinois, Ohio and Kentucky in 1884.

Now, although we were to set aside, altogether, any consideration of personal honor and truthfulness, though we were to repudiate the first principles of international confidence, though we could accept the Jesuitical aphorism that "*the end justifies the means*," and conclude that falsehood is better than truth, if we can only deceive our competitors, do those who have advocated and practiced this course of denying the facts really believe it could serve their end? Let the reception given to Mr. Emory Storrs, by Lord Granville, answer the question.

As a lawyer of recognized ability, Mr. Storrs was selected by the cattle dealers of Chicago to proceed to London as their advocate, and to impress upon the English government that "there was no contagious disease among cattle on the American Continent." Earl Granville at once laid before him the official reports of our government attesting the then existing area of infection. Naturally enough, Mr. Storrs felt at once that his mission must prove a failure, and that he himself had been placed in a most false and invidious position. Had he acted on his newly-acquired knowledge, and advocated the extinction of the one cause of all restrictions placed on our live-meat trade in England, it would have been to his credit. But according to the *Breeders' Gazette*, he returned to America, denouncing "a set of cranks, whose mouths must be stopped before anything can be done with the English government," evidently acting on the pernicious and immoral hypothesis that a legal advocate is bound to gain the case for his client at all hazard, and that truth and justice are with him to be subordinated to success. Thereafter he continued to make his antagonism to sanitary measures to be felt through the newspapers and in the lobbies of Congress, and doubtless contributed largely toward divesting the act for the creation of the Bureau of Animal Industry of every clause which would enable the head of that bureau to interfere effectually for the suppression of any animal plague outside the District of Columbia. Mr. Ruskin says a lawyer is bound to sacrifice his life rather than countenance injustice. Whether the theory of Ruskin or the practice of Storrs will do most to ennoble the bar, to advance civilization, or to perpetuate free institutions, it is not difficult to decide.

But what could Mr. Storrs and his clients expect to gain through

their attempt to commit the United States government to their own position? We have seen from the English official documents that the British government was not dependent on our official publications for their knowledge of the existence of lung plague on our shores. Earl Granville was under no necessity to adduce our reports in making his answer. He argued, doubtless, that these American reports would be less objectionable and more conclusive with Mr. Storrs, but if it had been necessary, he was prepared with his own evidence collected by English consuls and experts.

To have committed our government to the principle of denial was simply to have forfeited the confidence of Great Britain, and to have discredited whatever representations we may hereafter be warranted in making as to the soundness of our herds.

It is still to be hoped that the day will come when we can truthfully assert that our land is free from exotic animal plagues, from the St. Lawrence to the Gulf, and from the Atlantic to the Pacific. But in what position would our government be to attest this, if it had, during the present existence of lung plague infection, given assurances to the British government that no such infection held a place on our soil? Yet this is just what the Chicago dealers and their legal advocate would have subjected us to. Every one must see that such bold assertions could only result in national discredit, and in still further postponing the reopening of the English market.

I would wish here to repeat what I stated the other day at the dairymen's convention in this State, an estimate of the losses which we, as a nation, have sustained in the past six years from this successful opposition to all effectual measures for the stamping out of the one exotic pestilence of lung plague.

LOSSES ON EXPORTS OF LIVE FAT CATTLE.

From the estimates furnished by shippers, the losses on our live fat cattle in England as compared with the time before the compulsory slaughter clause was put in operation against us, amounts to fifteen dollars and upwards per head. In 1880, the second year of the compulsory slaughter, our exports were 182,756 head, valued at $13,344,195. The loss on these, at the lowest estimate made, was $2,741,440, or nearly twenty per cent of the entire value. Suppose we multiply this yearly loss by the six years during which this compulsory slaughter at English ports has been in operation, and still keep by the lowest estimate, we find

that as a nation we have thrown away $16,448,640 on this one item. According to Prof. McEachran, Canada profits to the extent of $1,500,000 per annum, through exemption from the slaughtering clause, though she exports to England but one-third the cattle we do. The same estimate for us would make our yearly losses $4,500,000, or for six years, $27,000,000.

LOSSES ON THE PROHIBITION OF STORE CATTLE EXPORTS.

But this is only the beginning of our losses. We can no longer export to England our thoroughbred cattle for breeding purposes. Formerly there was a considerable trade in this stock, and as the shipments were all of the finest quality and the highest price, it brought in a large revenue. We are now yearly importing thoroughbreds valued at not less than $1,000,000. It does not seem extravagant to estimate the loss from the suspension of our trade to Europe at half that sum. Then a demand has grown up for young lean cattle of common breeds to be matured and fattened on English pastures. I do not think that this traffic would have been seriously overestimated at $1,000,000. But to keep within bounds, I shall suppose that the suspension of the British trade, in both thoroughbred and common store stock, amounts to but $1,000,000 per annum. This would raise our losses, for the six years, to $22,448,640.

LOSSES ON THE PROHIBITION OF SHEEP EXPORTS TO ENGLAND.

But the restriction laid on our live animal exports to England does not end even here. Since the 23d of November, 1879, our sheep also have been subjected to the compulsory slaughter at the port. Now it is comparatively easy to estimate the losses on this item. From English official statistics it appears that we sent to Great Britain in 1879, the year prior to the restriction, 119,350 sheep, and that since then up to 1884, our shipments have amounted to an average of 65,000 yearly. The falling off is 54,340 head per annum, worth, at five dollars per head, $271,700, to which is to be added a loss of twenty per cent on those still sent, or $65,000, amounting to a yearly loss on sheep exports of $336,750, or for the five years just past, $1,683,750.

Our exports of swine have, under the same restriction, declined from 15,180 head in 1879 to zero in 1882, but with the recent demonstration that trichinous pork is harmless after it has been

salted for two months, the future of that trade will doubtless tend toward hams, and the abolition of traffic in live hogs need not be considered.

PROBABLE LOSSES IN HERDS IN OUR INFECTED DISTRICTS.

The yearly losses in the districts infected with lung plague on our eastern seaboard, occurring as they do largely in city dairies among animals of a high market value, and yielding a high-priced product, may be set down at $500,000 per annum. This for the six years that have elapsed since the English restrictions were imposed, and since the question of stamping out has been actively urged in Congress and Legislature will amount to $3,000,000.

COMPETITION IN ENGLAND FROM OTHER SCHEDULED COUNTRIES.

Still another consideration should be entertained in connection with the English restrictions, but it seems hitherto to have escaped all who have undertaken to compute our losses. England's yearly cattle imports, from scheduled countries outside of the United States, and subjected to the same slaughtering clause, are 99,937 head. These are of course fat stock, and if estimated at the average value of our export cattle (seventy-three dollars per head), will amount to $7,295,401. How much of this trade could be secured by United States shippers it is impossible to say, but since, even under our present drawbacks, we shipped in 1883 as many as 154,631 cattle, it is reasonable to suppose that with a further margin of twenty per cent in our favor, we could secure a very large proportion of this trade. Remove the slaughtering clause from United States cattle, and it would not seem very unreasonable to hope that we might secure for ourselves one-third of the trade now carried on with other scheduled countries. This would furnish an actual balance in our favor of $2,431,800; or though we do not count principal at all, but only a twenty per cent profit on this sum, it would amount to $500,000 per annum. Six years of this would count $3,000,000 in all.

COMPETITION OF OTHER COUNTRIES IN THE REFRIGERATED MEAT TRADE.

Another and very threatening source of loss is the competition in refrigerated meat, which has grown out of our neglect of our exotic animal plagues. This persistent neglect, as we have seen, has riveted on us the shackles of the English slaughtering clause.

The millions of yearly losses entailed upon us by the operation of this clause has set the inventive American to work to devise some method of escaping the drain, and the attempts have been made mainly in the direction of canned meat and refrigerated meat. Meat that has been canned is never quite satisfactory, and the refrigerated variety has taken so well that our Eastern States are now dotted everywhere with depots of such meat from the great slaughter-houses in the West. The effect on our cattle-raising industry in the East may be inferred from these figures:

Tons of Cattle and Dressed Beef supplied to—

	Boston.		New England (outside Boston).	
	Cattle.	Beef.	Cattle.	Beef.
1878	95,250	2,870	58,340	2,233
1883	88,451	43,713	12,448	73,036

Thus our beef trade in the Eastern States has been almost completely revolutionized, and our eastern cattle industry suffers accordingly. This has been accomplished by the refrigerating car alone. By the addition of the refrigerating ship the market for chilled meat has been extended to England, and for the moment it seemed to our dealers that the great problem had been solved, and that the more immediate ill-effects of the English embargo had been done away with. *The market had been saved; there would not be any interference with a perfectly free cattle traffic at any point of this continent as there must have been in order to stamp out lung plague; as to the infection of the western herds, that had not yet occurred, and need not be met till it comes; "sufficient unto the day is the evil thereof."* But this maxim is intended only for evils that we can not obviate, and never as an excuse for the reckless and improvident. And now our recklessness and improvidence are bringing upon us the merited retribution. Our very adroitness indeed by which a few set themselves to temporarily hide an evil, and to profit by such secreting in the present, with an utter disregard of the future, now comes back upon us, like a boomerang, with all the force of our own sturdy blow. The refrigerating ship which we invented and launched upon the ocean has been adopted by the Australian and Buenos Ayres trade, and now England is to receive fresh meat from countries in which no winter interferes with cheap production, where cattle can be profitably raised for their hides and tallow, and where dried beef can be sold at one cent a pound.

In this connection I may well recall what I said a few years ago: "No country has ever been so tenderly dealt with by lung plague as the United States, for the current of cattle traffic has opposed its spread, and in no country has a better opportunity been afforded for the extinction of the contagion; so no country shall have incurred a greater measure of blame than shall we if we allow the plague to spread to our unfenced ranges, and to secure a general diffusion which no skill, effort nor outlay can cut short nor abolish." It seems now as if in still other directions permanent and irremediable injury is coming upon us through our continued criminal neglect. We have deliberately thrust away from us the teachings of history and the admonitions of reason, and we must now begin to learn the bitter lessons of experience, when it is impossible to save ourselves from the evils that are overtaking us. Buenos Ayres, with greater advantages than we have in soil, climate and proximity to port, for the cheap production of meat, with a freedom from all imported old world plagues, and at a distance from England only a little greater than that of Wyoming, is now a dangerous competitor in the British market, a competitor introduced by our own blamable neglect, and one that has come to stay. There is practically no limit to the competition from this source, and it may be that it will now matter little to us whether the English live-stock market is open to us or not; our repentance may have come too late to retain that market, yet it can never be too late to save ourselves from the still greater evil of a general extension of the infection, so long as it remains possible for us to crush out the lung plague from our midst.

If we should decide to let the evil run on in its natural course, if we allow the ignorant or selfish clamor of a few interested parties to prevent the extinction of this plague, we have another evil no less permanent, and even more prejudicial to face. This is the general infection of our fields and markets, the decimation of our herds, the depression of our agricultural industry — the greatest and most fundamental of all our sources of income — and as a consequence the depression of all our other industries, which must suffer in the same ratio from the scantier and dearer food, and from the higher wages which must place us at a disadvantage in competition with more favored nations engaged in the same kinds of industry.

SOME OF OUR ESTIMATED LOSSES FROM LUNG PLAGUE AND ENGLISH RESTRICTIONS.

If we now sum up the estimated losses from these different causes, in connection with the existence of lung plague in our eastern herds, and the operation of the English restrictions, we obtain this result:

Losses for six years on export fat cattle	$16,448,640
Losses through prohibition of export of store cattle, six years	6,000,000
Losses on our exports of sheep, five years	1,683,750
Losses in our infected home herds, their products, etc.,	3,000,000
Total	$27,132,390

From this sum total I have purposely excluded the three millions and upward, which I have referred to as probably attainable if we could compete on better terms against the other scheduled countries. But even without this we have a sum total that may well arrest the attention of the citizen and statesman, and arouse at last to an earnest effort to stamp out from our midst this animal plague of European origin.

After ten years of warnings through the public journals, I six years ago urged this course directly upon Congress and Legislatures as the only means of reopening the English market to our live stock on the most favored terms. I then gave the opinion that $2,000,000 judiciously applied would stamp out the imported lung plague, and thus remove the greatest barrier to the reopening of the English markets.

In 1878 I wrote an article for the March issue of the *National Live Stock Journal:* "Now comes the question, pregnant with weal or woe to our future stock, agricultural and national interests, shall we learn from the disastrous experience of others and extirpate the lung plague from the United States while it is still possible, or shall we sit quietly by with folded hands and await the inevitable, early or late, infection of our western stock ranges, and then repeat, for the benefit of other nations, the already twice-told tale of a desperate and extravagant but fruitless attempt to suppress a plague which we have criminally allowed to pass beyond our control? With or without a prodigal but vain effort to crush out the poison, the result may be thus summed up: The infection of stock-

yards, loading banks, cars and markets, and a general diffusion of the plague over the Eastern States. This would imply a national loss from cattle disease like that of England, but much more extensive in ratio with our greater numbers of stock. Thus England, with her 6,000,000 head of cattle, has lost in deaths alone from lung fever in the course of forty years, over $500,000,000. We, therefore, with our 28,000,000, should lose not less than $2,000,000,000 in the same length of time, allowing still a wide margin for the lower average value per head in America; and this drain is for deaths alone, without counting all the expenses from deteriorated health in the survivors, of produce lost, of loss of progeny, of loss of fodder no longer safe to feed to cattle, of diminished harvests for lack of cultivation and manure, of quarantine and separate attendants whenever new stock is brought on a farm, of cleaning and disinfection of sheds and buildings," etc.

In the following winter, before the Committee on Agriculture of the national Senate, I testified: "For ten years I have been publicly warning the country of the danger of allowing this disease to extend to our Western States and territories. Infection of the western herds means speedy infection of all the cattle cars, of the railway yards, loading banks, etc., and the starting of a constant stream of infected animals toward our Eastern States and markets. This means an uniform infection of the country and loss of thousands of millions of dollars in a short space of time."

In my report written in 1879, and printed in Assembly document No. 31 of the State Legislature in 1880, I state: "But even with a clean bill of health, which she has not enjoyed for over a quarter of a century, New York can never be safe for a single hour so long as the malady prevails in the States south of her. As this is a work for the good of the continent, it is only right that the Federal exchequer should bear the burden of clearing the States and of reimbursing New York for her outlay in this matter. But if it were requisite, this State could better afford to pay her own bills in full, and then contribute freely toward the extinction of the pestilence in the neighboring States, than she could to maintain a permanent and expensive interference with her trade, to protect her against a renewed importation of the plague. With the plague surviving in any of the States south of us, an eternal and expensive vigilance would be the price of safety, and safety would not always be assured even by this, as no State control can give absolute pro-

tection against the smuggling in of infected cattle, while the preservation of the plague at any point on the continent must one day entail the infection of the plains, of the cattle traffic and of the country at large."

In the report of the Treasury Cattle Commission, February, 1882, I said:

"We prohibit the importation of European cattle except under a quarantine of ninety days. For the same reason precisely we should prohibit the movement of cattle out from an infected State or district, except under a quarantine of similar length. Every argument that can be advanced for the one is equally valid for the other. The same law that condemns murder condemns suicide also; the same considerations that expel the pillaging foreign army, doom the native robber as well; the same rule that quarantines the yellow-fever ship sends the city small-pox patient to the hospital. The lung plague in our own infected districts is no less dangerous than that which may be imported from Europe. If we allow this plague to reach our great open pasturages, it will matter little whether it came from Liverpool or New Jersey, from York or New York; the effect will be the same. It will be none the less virulent and deadly in Montana, that it has already devastated the fields of Maryland. When it passes into the busy channels of commerce, it will matter nothing whether it emigrated from the Old World thirty years or thirty days ago; the disaster will be no less great and the ruin no less remediless.

"It is a matter of honor and consistency, as well as of self-protection, to prohibit movement of cattle from infected States. We can appreciate the folly of England in imposing compulsory slaughter on American cattle at the port of debarkation, and admitting freely the stock from the plague-stricken mountains of Ireland; and seeing this, we cease to wonder at the perpetually recurring outbreaks in spite of a most expensive system of suppression. We condemn England for this folly, but in so doing we condemn ourselves also.

"At the end of 1881 we could pronounce the Great West free from this plague, but in the absence of a prohibition of the movement of cattle from infected States, we can not guarantee this for a single day. Upon the protection of the West all future success in dealing with this plague depends, and thus the prohibition named is the first essential step in the course of extinction."

In this report Congress was urged to appropriate $1,500,000 to be disbursed by some Federal officer for effective work in the States, and by State officers, in stamping out this disease, such work having been first approved by a Federal veterinary sanitary board.

In our report, submitted in January, 1883, I again pointed strongly to the danger of the extension westward of infection through shipments from our infected districts. After adding a number of instances of such extension, for distances of fifty or one hundred miles, I went on to say, that "with a disease like the lung plague, which might remain latent in the system of the infected animal for ninety to one hundred days, it would be just as easy to have the infection sent out from these markets" (New York, Jersey City, Baltimore, etc.) "to Terre Haute, Kansas City or Cheyenne. It will not be at all surprising if it shall prove that the plague has already been carried to the great cattle-growing regions of the West in some of the extensive shipments of last autumn. If such has really been the case, it may be expected to show itself along the lines of cattle traffic from the infected western center in the course of the coming year. Even in such a dreadful contingency it may still be possible to stamp it out, but only at a great increase of expense and at the cost of a much more serious interference with the cattle traffic, provided, always, that the pestilence has not yet reached our unfenced cattle ranges."

"In view of the above, we beg to reiterate with greatly increased emphasis our recommendation of a year ago, that the FEDERAL GOVERNMENT SHALL FORBID THE MOVEMENT OF STORE CATTLE OUT OF ANY INFECTED STATE, TERRITORY OR DISTRICT, INTO ANY OTHER STATE, TERRITORY OR DISTRICT, EXCEPT AFTER A QUARANTINE SUCH AS IS NOW IMPOSED ON CATTLE FROM INFECTED FOREIGN COUNTRIES."

In our report, submitted December, 1883, I said:

"It is better far that every one, and above all every member of Congress, should face the truth, evident from the first to those acquainted with this malady, and now attested by four years of British restriction, that nothing short of the absolute and undeniable extinction of this disease in the United States will reopen the British market to our live cattle, and save us those millions which we are now every year prodigally, and we might almost say, insanely throwing away."

NO SUFFICIENT ACTION BY LEGISLATORS.

All such representations, whether made as a private party, or as a member of a commission appointed by Congress to investigate this subject and report upon it, have led to no such action as the circumstances demand. Some few things we have secured, such as the quarantine of all imports of cattle from foreign countries, outside of North America, the inspection of all sheep, swine and goats imported from such countries, and the right to quarantine them if found infected, and finally, the creation of a bureau for the *investigation* of diseases of animals. We have further secured from at least two States and one Territory a prohibition of the importation of cattle from districts known to be infected, and also the appointment of one Territorial and three State veterinarians. These are all steps in the right direction, but even as a whole they are most wretchedly inadequate to the demands of the occasion.

INFECTION OF OHIO, ILLINOIS AND KENTUCKY.

If any proof of this were wanted it is furnished in the recent extension of the lung plague to Ohio, Illinois and Kentucky. The infection carried, it is alleged, from the vicinity of Baltimore, where there is a State veterinarian, to Epler's herd in Ohio, found no difficulty in entering Kentucky and Illinois, though the latter State was also provided with a State veterinarian. The trouble was that in the duties laid down for these State veterinarians there was no provision against the exportation of infected animals from an unsound district, nor for the supervision of animals newly imported into a State, until such animals can be attested sound. Had the Maryland State veterinarian been under obligation to attest that the herd from which the Jerseys were sent had suffered from no sickness, nor had any deaths for the six months prior to the sale, and that there had been no additions made to the herd from outside, except through quarantine, nor any contact with any member of the herd with outside cattle; or, failing all this, had he been under obligation to see that the cattle to be shipped had been passed through a rigid quarantine for three months before shipment, he might then have been able to furnish with them a reliable certificate of health. Or had the State veterinarian of Illinois been under obligation to see that all herds receiving cattle from outside the State were kept under rigid seclusion or quarantine for three months, under frequent veterinary inspection, there is

every reason to suppose that the infection would have been early discovered and as promptly extirpated. But so long as the duties of State veterinarians are confined to the inspection, etc., of cases of disease that may be reported to them, their discovery of imported contagion will be a mere accident, and is likely to be made at a dangerously late date, after the infection has already spread widely and disastrously. In some States the importation is so great that it would be impossible for one State veterinarian to maintain the necessary supervision. In such a case he must be provided with a sufficient number of deputy veterinarians to overtake the work. It is difficult to see any escape from this so long as a State must act independently and protect herself against all other States. The recent experience of Illinois and Kentucky, infected by stock from Ohio, a reputedly uninfected State, shows the utter futility of interdicting imports from States and districts only which are already known to be infected. So long as it is possible to carry animals out of an infected district without those precautions which shall guarantee soundness, so long must there be an element of risk in receiving animals into your herds from any point to which such infected animals may be taken.

This alone is what gives consistency to the present action of England in applying the slaughtering clause to all our cattle, western as well as eastern. There is at present nothing to hinder the infection from making a stepping-stone of the second range of States west of the infected ones on the Atlantic seaboard, and thence taking a new start, in a few weeks or months, to any other point, even it may be to our open-grazing Territories, there to lay the foundation of that general and permanent infection, and those immense losses which I have indicated. In view of this danger, one of two things ought to be done—either every State or district in which the lung-plague infection exists should adopt the most searching and rigid measures for the discovery, isolation and purifying of every infected herd and place within its borders, a resort which would furnish an unassailable basis for the furnishing of certificates of freedom from infection to all animals moved within her Territory or exported to States without; or each State and Territory should provide for the perfect seclusion of all cattle newly imported from other States or Territories, and of the herds into which they were taken, until such time as they can be surely attested sound. The first resort is undoubtedly the best, the cheap-

est and the most effectual, seeing it would speedily rid us of the infection altogether, but it necessitates the intervention of the Federal government. The past has conclusively shown the hopelessness of securing a simultaneous, uniform and effective action by all the States now infected. But if the Federal government stood ready to meet all bills for thorough, judicious and effective work, approved by Federal experts, there could be no possible reason for delay, or for ignorant or perfunctory measures. The only danger then to the State treasury, or to State officers would be in slackness in effort or in deviation from the thorough system laid down by the Federal officials, and the consequent refusal of the Federal disbursing agent to meet the expenses. There would, therefore, be every inducement to do the work in the most thorough and efficient manner. If, in addition to this, the Federal government were to step in and forbid the export, from any State or district infected with lung plague, of cattle taken from herds in that State or district, or that had been unshipped from railroad cars or other vehicles within such State or district at a point where they would be brought in contact with the State or district cattle or with suspected ones, then prompt and effective action might be safely counted on. The loss to individuals from such a prohibition would be far less than is supposed. Sales of our thoroughbred and common stock could still go on within each State, and whatever limitation there would be by reason of inability to sell to parties outside the State would be largely compensated by the increase in the herds, and by the greater confidence and better market which would follow as soon as the extinction of the lung plague was officially determined. The period of restriction under the application of the most thorough measures would be somewhere from one to two years only, and the expenditure not to exceed $2,000,000. Four years of our present losses would cost us ten times this sum, to say nothing of the danger of other extensions like that of last year. We have heard much of attacks on the national treasury, but is it not sounder finance to expend $2,000,000 once for all, than to sink yearly $5,000,000 of the national wealth? Is it not sounder political economy to crush once for all at this trifling expense, an enemy that has preyed upon us for thirty-six years, that has acquired vantage after vantage, and that threatens soon to sieze the reins of power and subject us to a yearly tax of scores of millions?

The second proposed alternative seems far more difficult of attainment than the first, as it presupposes that every State and territorial government shall be induced to act. It presupposes further an extended machinery, which would entail an incomparably heavier drain on the public purse.

COMPARATIVE EFFECTIVENESS OF MEASURES FOR EXTINCTION OF INFECTION WHERE IT EXISTS, AND OF QUARANTINE AGAINST INFECTION.

One or two considerations may be added as to the futility of suppressive measures undertaken by individual States without any superior and coördinating direction. In 1879 work was begun energetically in this State, and little by little, Governor Robinson was brought to see that, to be at all effective, the most stringent measures must be enforced. These measures applied to New York city practically purified the city in three months. In the outlying counties they also proved successful, but the application of this stringency to Brooklyn was delayed and that city still continued extensively infected; its suburbs were even worse. From 1880 onward, in spite of the protests of sanitarians, the restrictions were gradually relaxed, until all that had been gained by so much effort and outlay was literally thrown away. Similarly, New Jersey went actively to work in 1879 and accomplished something, but with a change of administration, here also there soon came a curtailing of appropriations, until $5,000 per annum only were furnished; enough to meet some salaries, but ridiculously inadequate to do any effective work. Pennsylvania has done well on a small outlay, but only because her officials have never dealt with the lung plague except in country districts and on inclosed farms where the conditions of permanence are already reduced to a minimum, and because a premium has been offered for the report of sickness, in the form of a payment of full, sound value, for every animal that sickens after the officials have been notified. But they have never conducted any expert inspection of the city dairy cows, and can not tell whether the plague exists in such dairies or not; neither have they established any sufficient control over the Philadelphia markets. Delaware and Virginia have done nothing. Maryland has had a State veterinarian for a number of years; yet in these years more outbreaks of the plague in other States have been traced to Maryland than to any other

State; last, and not least, of these outbreaks is the recent one in the Mississippi Valley States. A few years ago the Governor of Maryland proclaimed that the disease had been finally extinguished in the State, but a visit made by Dr. Thayer and myself showed that the malady was even then not only common in the city of Baltimore, but was quite prevalent on farms in the country. Specimens of the diseased lungs were carried to Washington and left in the rooms of the National Board of Health. Again of late that State has, I believe, been pronounced free from disease, though practically nothing has been done to make it so. In two recent outbreaks in country districts the cattle recognized as diseased were slaughtered and the remainder inoculated; the city is always infected.

Now, how can any confidence be reposed in certificates of soundness under such a state of things? Not a cattle market under any sufficient control in any one of our infected States; most of them under no control at all. No inspection of herds in infected districts, of abattoirs, of rendering works, etc., to show where the disease exists and where it does not. No restriction as to the use of public conveyances by sick animals, nor any disinfection after such use. No previous knowledge of herds from which animals are to be shipped, but if a certificate is wanted, a simple examination to detect a disease, the seeds of which may lie undetected in the system for at least three months. No safe disposal of an infected herd but an inoculation of all survivors, a consequent multiplication of the germs of the disease and a preservation of latent cases to carry the malady elsewhere at a later date.

This is the present state of things, and under this state of things the different States must protect themselves as best they can against the inroads of infection. How imperfect such protection must be, may be understood when we consider that: First, they can have no absolute assurance that in taking in new animals they are not also taking in infection; second, that in purchasing single animals, especially, there is always the danger of these passing through a long incubation of 104 days, as in the case of the short-horn cow that infected Australia, or of that of Josiah Hedges' cow, which sickened on the Montauk pastures in 1879, therefore after a ninety days quarantine would have expired; third, there is no protection against chronic cases, so-called recovered cases, like the cow from the Blooming-

dale Asylum herd, which in 1883 carried the lung plague from the asylum herd to that of Mr. Warren of the Driving Park, White Plains, three months after what was supposed to have been the full recovery of the whole asylum herd; fourth, there is no assurance against the mild or occult cases, which too often fail to be recognized even by those living in infected localities, which in hitherto uninfected localities are pretty sure to be attributed to some transient illness of another kind, and which may perpetuate the disease for a period of six or even eight months in a herd, before it shows itself in a marked form.

In connection with this last item I am tempted to quote from the remarks of Professor Berdez, director of the veterinary school of Berne, Switzerland, as made at the International Veterinary Congress at Brussels, in 1883:

"I was sent by government to a farm containing sixty-five animals. This farm was not near a frontier, but in a secluded valley inclosed by forests and mountains; it was said that no one ever came there. The lung plague had broken out suddenly on this farm on which no strange beast had been introduced for at least six months. It was concluded that this outbreak was that fatal thing, an infliction direct from heaven. We instituted investigations, but to no purpose; it was held that the outbreak must have been a spontaneous one. We persisted, however, in our investigations, and found on opening one of the cattle which had stood beside a diseased animal, that one of the lungs contained a diseased mass, which percussion had failed to detect; this mass, as large as the fist, had all the characters of lung plague, and was supplemented by gangrenous masses of a grayish color. This was the last beast that the farmer had purchased, more than six months before.

"Here we have an animal which had lung plague, which preserved the germs of that disease for five months and infected a herd of sixty-five head. This animal appeared healthy, and if we had not slaughtered it, it might have been taken to market and infected thousands of others."

Such chronic and occult cases of lung plague are, unfortunately, but too common, and throw an amount of uncertainty around the three months supervision of any single animal imported into a State. Larger herds from an infected source are pretty sure to show disease at an earlier date. The single animal may prove the

exceptional one with the occult form of the disease or the unusually long incubation.

If, however, there had been a supervision of the herd from which the single animal was taken, and a record of perfect health and of the absence of any chance for the introduction of contagion for six months before, the guarantee would have been incomparably better. On the ground of safety, therefore, nothing can be better than a vigilant supervision of the herds in the infected district. But such supervision must be perfect in all its details, and no mere nominal oversight, much less a single visit and examination of the herd where one or more animals are to be taken from it. A perfect record of every herd and every animal in the infected districts, and a complete control of all movement, might be made to furnish to all stock-owners outside a perfect guarantee against infection. If the cattle dealers wish to protect the trade at large against inspections and delays, this is the field they should cultivate, as by proper attention here they can absolutely protect the cattle trade at large from any infection by lung plague.

Then as regards the relative cost of a thorough control of the infected districts and an eternal vigilance in all the other States and Territories, it requires no argument to show that the watch care of a narrow strip of each of six States must be much more simple than if our forty-seven States and Territories had to be kept under constant supervision. But even if this were otherwise, the fact that the efficient action in the infected districts, which we propose, would effectually extirpate the disease from the continent at a cost not exceeding $2,000,000, makes this without doubt incomparably cheaper than any mere outside precautions which must continue forever, as they would never bring the plague any nearer to extinction. I must, therefore, once more invite those economists whose sensitiveness to all outbreaks of lung plague is intimately connected with their apprehension of a drain on the public treasury, to reconsider the matter, to cease their advocacy of a simple pruning of this great upas of disease, and to join us in laying the axe to the root and destroying the exotic, root and branch. It is short, sharp and decisive work that alone will succeed in this matter, and once the work is done the necessity for outlay is over forever, so far as that plague is concerned. It is the trifling that costs; decisive and thorough work would rid us at once of every occasion for the outlay.

Were we veterinarians the predatory race we have been so slanderously called, we would find it much more to our pecuniary advantage to advocate the system of trifling and neglect, to remain dumb while we see the infection carried from city to city, from State to State, and from State to Territory; we should favor a medication which confessedly reduces the mortality, because each pound of such medicine would add to our pocket-books; we would advocate inoculations with fresh virus, or with cultivated or weakened virus, for assuredly the losses among herds already attacked can be lessened in this way, and every inoculation would contribute something to the veterinarian's coffers. In case of a general infection the inoculation of our 40,000,000 of cattle would be no small item of expense. And all outlay consequent on a general infection would prove a continuous one; therefore, the veterinary income would be permanently increased.

But in the practice of medicine there is an object higher than money-making. The consciousness of having alleviated physical suffering of man or beast, or of having contributed to the extinction of a disastrous plague, which else had dotted our fair fields for all coming time with the graves of its victims, and depleted the national coffers to a corresponding extent, is a source of satisfaction which no money can buy, and which no enemy can steal away.

I wish to add but a few words more on the advantage of the most vigorous measures in stamping out lung plague. In our own Putnam county, the owners of the teeming dairy herds seconded our suggestions most heartily, insisting that not a hoof be left in any infected herd, undertaking to bear the expense from county rates, if the State could not furnish the needful means, and in a fortnight the Putnam outbreak, which had been smoldering for months, became a thing of the past.

In the Grand Duchy of Baden, in 1865, the officers, *killing the sick only*, had to destroy 400 head. The stock-owners themselves requested that the law be altered so as to condemn *all that had been exposed to infection*, and next year there were but sixty-five diseased and suspected killed out of a bovine population of 100,000 head. From this time the number went on steadily decreasing, until, in 1881, there were but four, and in 1882 but one. It may be interesting to know that the expense was defrayed by a tax of five centimes per head of cattle in the Duchy, collected once in two years, and this paid for all losses caused by both lung plague and charbon.

Switzerland is another country where a similar measure keeps the State clear of this infection, except an occasional outbreak from newly imported cattle, which is always eradicated in a few days. The expense in this case is met by a charge of thirty centimes for a certificate to move any animal. This forms a fund which is sacredly reserved for this use, even in war time, and has always proved sufficient. Berdez says: "This measure is in practice in Switzerland, a country which is certainly not the most servile in Europe, and if the Swiss farmers allow their diseased and suspected cattle to be killed without protest, it is because they recognize the utility of the measure." "We have single pasturages containing 250 head of cattle. When lung plague exists, we call to our assistance the *bloody knife*, which so frightens some, and it renders us the most signal service. We are not rich in my country; we can not construct a *palais de justice* like that which we have yesterday admired (Brussels new town hall); we find, however, the means of indemnifying the proprietors when we are obliged to slaughter their cattle. Do not forget that Switzerland imports more cattle than it exports; we import yearly over 15,000 head. Still further, we are in conditions identical with yours. We have a large cattle trade, we have large herds and great congregations of cattle, and it is only because of the measures adopted that we are able to protect ourselves against lung plague. These measures embrace the slaughter of all cattle found in a contaminated stable." "Slaughter is not such a terrible measure as some seem to suppose it; above all, if applied in time, we put an end to the malady by the immolation of a score of beasts; the indemnity is then inconsiderable and easily paid, and the sum laid out is infinitely less than the losses caused by an epizootic spread in the country. I do not fear lung plague because of the loss of animals which it occasions, but because of the restrictions which it imposes on trade and commercial relations in connection with the measures of sanitary police which it necessitates. If we have resort to such a slaughter as I recommend we cut short these restrictions in a very few days, and I have constant evidence of the utility of the measure."

Zundel, of Strasburg, tells us that in Alsace and Lorraine the lung plague has been completely stamped out by the same measures.

Professor McCall has furnished a similar interesting statement

as to the city of Glasgow. From 1869 to 1872, 258 cows were attacked in that city, of which 139 were sent to the butcher, twenty-eight died and ninety-one recovered. The loss was £650 per annum ($3,250). In 1873 compulsory slaughter with compensation at half the sound value was instituted. From 1873 the yearly number slaughtered decreased from 203 head, in the first year, to thirty-nine head in 1880, since which time, up to 1884, there has not been a single case of lung plague found in the city.

The most conclusive argument, however, for dealing with the plague in the infected district and in the infected herd is that it avoids all interference with the general cattle traffic; all infection of railway yards and rolling stock, of boats and markets; all expenses for general disinfection of such public places and vehicles; all outlay for frequent inspections in public markets, on lines of traffic and in herds newly imported into States and Territories, and last, but not least, it heads off all interested opposition by carrying companies, stock-yard companies and stock exchanges to the measures of extinction. In the single item of the railway traffic, there is an unanswerable argument in favor of the most stringent local measures as against all others whatever. So long as animals had to travel slowly by road, it was possible to restrain animal plagues by inspections and quarantines at the frontier. The days and weeks consumed on the way afforded time for the eruption of any germ that might lurk hidden in a herd, and thus a short delay proved a perfect measure of precaution. But with railway transit the time is reduced from weeks to days, and it is not difficult for the germs of contagion to escape inspections at a number of frontiers in succession and finally to plant a plague at the opposite side of a continent. In Europe accordingly the call is imperative for the strictest local suppression as a means of furnishing reliable international guaranties with the herds and of securing a greater freedom in the traffic under the protection of such guaranties. With us the need is no less imperative. A visit to our stock-yards at New York, Jersey City, Camden, West Philadelphia and Baltimore, all in the infected districts, will convince any one acquainted with lung plague of the impossibility of controlling and tracing all the stock that passes through these yards. Under a system of bonded yards, into which western cattle only should be admitted, some guaranty could be given until an extension to the west, like the late outbreaks in the Mississippi

valley threatened the bonded yards as well. To prevent such an accident, it must be provided that no cattle shall be moved outward from our infected districts. But such a provision carried out so efficiently as to protect the West could be made to protect our eastern markets as well, and thus the expense of bonded yards may be done away with. As regards the expense of a complete suspension of cattle movement in infected localities until all infected centers are discovered and rendered sound, it would be a mere bagatelle as compared with any general interference with the cattle traffic. Indeed, if it were needful for the United States to purchase at full market value all cattle found within the narrow limits of our infected districts, the cost would be but a trifle as compared with any general interference with the general cattle traffic. But this is not at all needful. Let the strictest record be kept of all herds in infected districts until every center of infection is discovered, let extinction of the entire herd and thorough disinfection follow on the heels of discovery, and at a trifling outlay the nation will speedily get rid of a yearly tax of millions. All other measures, as compared with this, are wasteful, improvident and unscientific.

ONE DISEASE PREDISPOSES TO ANOTHER — LUNG PLAGUE, TO TUBERCULOSIS.

I shall offer but one other consideration in favor of the speedy extinction of lung plague. I have often been asked if the flesh or milk of animals suffering from this disease can be safely consumed by man. The answer is that neither can convey the disease to man, for he, like all non-bovine animals, is entirely insusceptible to it. The fevered meat and milk are less wholesome and may induce digestive disorders in the weak and the old, in infants and invalids, but it manifestly can not produce in man the bovine lung plague. In its far-reaching effects, however, the disease is seriously prejudicial to man. In predisposed subjects and in the presence of the specific germ of tuberculosis, every local inflammation, every resulting exudation, and every step in debility, lays the system more open to the attacks of the tuberculosis bacillus. The inflamed lungs, therefore, of the victim of lung plague and its debilitated system are alike receptive of the deadly tubercle germ, and thus the lung plague, which respects humanity, paves the way for the far more insidious, yet more redoubtable tuberculosis,

which attacks all warm-blooded animals with little discrimination. It is now thoroughly established that this disease (tuberculosis) is not only inoculable, but communicable through the meat and milk, and thus our tuberculous herds are continually contributing to the propagation of the dread disease in man. In many localities we find large herds tuberculous almost without exception, and medical statistics tell us that in very many places not less than five per cent of the human population are sufferers from the same disease. It is even shown that twenty-eight per cent of all the adult males dying in New York city are tuberculous. To the extent then to which this bovine lung plague is laying our cattle open to the attacks of tuberculosis, it is also contributing to sustain this tremendous sum of human suffering and death. With this consideration, the question in hand advances beyond the plane of mere political economy or national thrift to become a question of morality, of humanity, of self-protection. For those who are unmoved at the loss that is accruing to the nation in the aggregate, because it does not seem to affect very directly their particular purses, I commend this consideration of protection of their customers, their families and themselves. If their patriotism can not reach out to the whole country, their affections may at least claim a thought for those near and dear to them, their religion may present a claim for suffering humanity, or their fears an argument for self-protection.

WHO SHOULD DIRECT VETERINARY SANITARY WORK.

Before concluding, I wish to make some remarks on a subject on which I have been misapprehended. A letter of mine to the Stockman's Convention at Chicago has been heralded all over the country as a violent attack on the Bureau of Animal Industry. I regretted much to see that Dr. Loring seemed to have so far parted with his customary acumen as to have led off with this idea. Any one who will intelligently read that letter must see at once that it had a far different object. That object was to sustain the principles, that first, no person should be called on to administer a law who has a direct pecuniary interest in the results of such administration; and second, that no person is competent to administer a sanitary law who is not an expert in the diseases it is sought to suppress. As being alike out of office, and out of the race for office, which latter I never entered, I thought it not unsuitable that I should call atten-

o these fundamental principles of government, and in illustrating my points, I adduced the experiments at Barren Island, undertaken to test whether lung plague was contagious, and which could only be explained on this ground, that the non-professional commissioners in the bureau required to be educated before they could act, and that a practical lesson in the very alphabet of the subject was essential. I did not think of blaming Dr. Loring for the fact that the law had provided for him non-professional commissioners, nor for the necessity he felt under of educating these men in their duties, but I did intimate that the principle was a wrong one, and that a better law could have been devised.

Another striking instance of the correctness of my first position has come out since. To the St. Louis Convention came a host of southern men to carry a resolution in favor of a national cattle trail, of six miles wide through Indian Territory, Kansas and Colorado. Such a trail approved itself perfectly to the Texan, who would thus find a cheap route to the northern market. It approved itself to the Wyoming and Dakota men, because it would protect them against Texas fever, the germs of which would be eliminated from the systems of the trail cattle before they reached their frontiers; but not a thought appeared to be given to the northern part of the Territory, to Kansas and Colorado. Such a trail could not be fenced in, and neighboring herds must stay on it with fatal effect. Even if fenced, it must be crossed at frequent points by the cattle of the States through which it passed, and these could neither pass over the six miles of trail on a bridge or under them in a tunnel. Every bovine animal that licked the grass in crossing this trail would almost certainly be doomed. According to Governor Glick, Kansas lost $500,000 last year from this disease alone. Now what right has the south, the north, west or the general government, to impose such a scourge on Kansas?

More than this, there seems now to be no doubt that this southern cattle fever is yearly advancing northward, and consequently infecting new territory permanently. A cattle trail, therefore, would be a line along which that poison would be more rapidly extended, and from which it would in turn extend laterally in the States traversed. If there is any such thing as State rights at all, surely this is an intrusion which a State has a right to resent and resist.

Yet the Texas men at the convention are represented to have

gone in in a body for this intrusion. Doubtless any of these men would be quick to see the impropriety of such a trail, if it in any way affected their own personal interests; further, there are honorable and noble men enough in Texas who would condemn such a trail as iniquitous, although its rejection should seriously impair their own incomes; but the principle is right, nevertheless, that no man should be put in a position where he will be required to administer a law to his own disadvantage, and therefore men who are interested in the results of a given law are not the proper persons to administer it. With sanitary laws, the first consideration as regards their administrator is that he should be a physician, fully acquainted with all the phases of the plague to be suppressed, or the results of the unsanitary conditions which are to be abolished; the second consideration is that, in addition to this professional capacity, he should be entirely free from any pecuniary interests, which will be affected for better or worse by the sanitary administration.

OUR LEGACY TO THE COMING GENERATION AND TO THE TWENTIETH CENTURY.

Let us now sum up what we have done, and what we have left undone, of our duty in this matter. Those of us who had studied animal plagues saw, sixteen years ago, as clearly as we do to-day, that we were loaded with a very great responsibility as to what we would hand down to the citizens of this republic and the twentieth century. We were then doubling the numbers of our cattle every thirteen years, which, by the end of the century, would make us the greatest live-stock country in the world. We were already practically the granary of the world, and it only remained for us to foster and protect our live-stock that we might supply the world with meat as well. With a little care and a very slight expenditure we could hand down to our successors one of the grandest legacies that one generation ever left to another, one century to its successor. But we saw none the less clearly the worm that was gnawing at the root of our splendid growth and we foresaw that this worm must multiply with the increase of that on which it fed, preventing the full expansion of the branches and ripening of the fruit. We saw that with our bequest we might bequeath also the ever-gnawing worm which would dwarf the profits of the live-stock industry and disqualify our stock-

raisers for competition on equal terms in the market of the world. We saw that our only hope lay in crushing this worm, of preventable animal plagues, and leaving our splendid estate untrammeled by mortgage and untarnished by plague.

To secure this desirable result, something has been done. Importations of cattle from abroad have been subjected to a quarantine which, when faithfully carried out, gives a guarantee that infection through this genus (Bos) shall be excluded. Sheep, goats and other ruminants, and swine, are examined on landing, and if found to be infected may be also quarantined. Six States and Territories have appointed official veterinarians with the duty of investigating all outbreaks of contagious disease and quarantining the herds. The Department of Agriculture has been enlarged by the establishing of a bureau of animal industry, with the power to investigate disease and to coöperate with State authorities in the stamping out of contagious diseases, and the arrest of preventable ones.

We bequeath to them further the accumulated discoveries of the last quarter of a century in the life-history of disease germs. We bequeath the knowledge of the particular character and the propagation, by a constant and unbroken generation, of disease germs. We leave the knowledge of the mode of survival and increase of several of them outside the animal body as well as inside it. We entail the knowledge of how some of these germs may be destroyed out of the body by particular disinfectants; how some can be rendered harmless to the individual by reduction to a minimum dose, by injection into the blood, by inoculation on an insusceptible part of the body, or by a diminution of their power through heating or through culture under special conditions of life; and how the susceptibility to others may be lessened through inuring the system to the action of their chemical excreta. We devise to them all these grand discoveries which, after all, are but means of reducing the mortality without the one great need of utter extinction of the germ itself; all, therefore, insufficient to rid us speedily of our animal plagues.

But, on the other hand, there is no legal power to quarantine sheep, goats and other ruminants, and swine, unless they are found to be actually diseased on arrival from abroad, and thus any contagious disease to which these are subject may possibly be introduced in animals in which it is still in the state of incubation.

Then in the case of horses we do not take the precaution even to examine the arrivals, and the imported animals may come in not alone in the stage of incubation of any one of the deadly plagues from which these animals suffer, but, so far as the law provides to the contrary, with any one of these diseases in its full development.

Again as regards our indigenous and implanted contagia. We have no provision in a single one of our great States, now infected with the lung plague, to prevent any one from taking an animal infected with this disease into any other State or Territory in the union. No State, not even those provided with State veterinarians, can furnish a reliable guaranty of soundness with any animal sent out of it. No State, not even one of those provided with a State veterinarian, has a provision by which animals coming from other States, and therefore open to suspicion, shall be quarantined or even subjected to supervision, until they shall be attested sound. No State infected with lung plague or any other pest, has a pecuniary and official provision by which every center of infection of such plague shall be discovered and stamped out. Scarcely one State has even a provision for the safe quarantine or seclusion of such center of infection. No infected State has a provision which will prevent the use of railroad cars or other means of public conveyance for infected animals, and the subsequent use of such cars in other States without any previous disinfection. No infected State has any provision to safely prevent the exportation from infected localities of hides, hoofs, hair, horns, tallow, guts, manure, fodder, litter, etc., which may become the means of conveyance of infection.

The bureau of animal industry has no power outside the District of Columbia, to enter a single infected herd for inspection except with the concurrence of the owner, much less has it any right to quarantine, to destroy or disinfect. It has no power to prevent the movement of infected cattle out of the locality nor into another State or Territory. It has no power to forbid the use of infected railway cars, canal boats, ferry-boats, steamers, etc., for traffic in animals susceptible to the disease the infection of which they carry, nor to disinfect such vehicles. It has no power to prevent the exportation from infected States of fodder, litter, manure, or fresh products of infected or suspected animals. It has no power to prevent the summer exportation from infected States of animals, which, though themselves insusceptible to the poison, yet

carry the germs of the most deadly disease to all parts to which they may be taken.

This neglect on the part of Legislatures, Congress and people is now costing us in a single cattle plague, which is not indigenous to our soil, no less than $5,000,000 per annum, and threatens, if much longer neglected, to cost us $50,000,000 per annum. A second of these plagues is said to have cost a single State $500,000 in the past year. A third is said to have cost a single county in Ohio 10,000 hogs. Through our negligence of to-day we are handing this down as a baleful legacy to the future heirs of this great republic, with a certainty of an extraordinary increase in the area of infection, and the sum of the losses in the not distant future. We bequeath to them, besides, a competitor in the meat markets of the world, who, but for our negligence, would never have thought of entering the lists, but who once entered will stay, seeing he can raise his stock on the cheapest and richest soil in the world, where the pastures never lose their summer freshness and abundance, where the harvesting and feeding out of fodder is unknown, where the stock can be kept in a fat, marketable condition at all times, without special effort or feeding, where the main cost is in marketing and slaughtering, where the pastures are in near proximity to the seaport, and where beef can be profitably sold at one cent a pound.

This is our legacy to the future of this great republic, and a shameful legacy it is, being altogether chargeable on our own persistent negligence and prodigality; persistent in the face of the most solemn warnings, and in the light of the most striking examples in history. So far as concerns the competition with South America and Australia, our sad bequest can not be recalled. Our children must eat the bread which our hands have so unkindly prepared, and if we should one day find ourselves shut out from the meat market of the Old World, we can but thank our own apathy and lack of wisdom, in listening to the false prophets of the stock yard and the press, who proclaimed peace and safety when destruction threatened, and who could announce only prosperity when our own apathy was gradually entangling us in the net of adversity.

But if this part of our bequest is irretrievable, it is the more necessary that we should bestir ourselves to save the tens and scores of millions which these plagues threaten to exact from

among the stock for home consumption. The one irreparable loss demands that we should be the more provident and careful of that which remains.

If we would still retain our place in the market of the world for our other agricultural products, for the products of our manufactures and our mines, let us protect and foster the basis of all industry, our food products. And as a chief means to this end, let us banish from our land those animal plagues which, in proportion to their prevalence, will bring to us and our descendants small profits, dear meat, high-priced manufactures and an exclusion from foreign markets.

Hints on Cheese-Making.

Paper read before the New York State Agricultural Society, January 21, 1885.

By GEORGE A. BONFOY, of Herkimer County.

To establish one set of rules for making cheese from all conditions of milk would be like recommending one remedy for all diseases of the human system. The quality of milk is very easily influenced by surrounding circumstances, both natural and unnatural; therefore, the rule that would be beneficial to one kind of milk would be detrimental to another.

I have adopted a few rules that I use in nearly all cases for making full-cream cheese.

First, warm the milk gradually to 83° in warm weather and 85° or 86° in cold, using enough of sweet, water-soaked rennet to coagulate in thirty-five or forty minutes, then cutting lengthwise and crosswise, letting it settle until the curd has entirely disappeared, after which, stir and cut carefully to the desired fineness, stirring and warming to 98° or 100°, being governed by the keeping quality of the milk as to the length of time for heating. If the milk is sweet and the curd cooks slow, then heat slow, but if it cooks fast, then heat fast.

The one-year old cheese that took the prize at the New York State fair last fall was made from full-cream milk and in the usual way, with the exception that it was salted three and three-quarter pounds of salt to the 1,000 pounds of milk instead of two and one-half, the curd was very fine flavored, well cooked and about one-half inch acid, and was not cheddared.

Where the curds are well cooked, are free and not inclined to settle together, and sweet flavored, I do not always consider it necessary to cheddar.

It is sometimes difficult to know just when to salt and press the curd. We have to be governed by the condition of the curd, and whether it is intended for home trade or for shipping.

A great deal depends on having good milk to make good cheese. Too much pains can not be taken by patrons in the care of milk.

I find from personal experience and observation that there is a great difference in localities as to the quality of milk.

Where cows feed on wet, swampy lands producing wild grasses, and have poor water to drink, the milk, when made into cheese, will be spongy and difficult to cook, of an offensive flavor, and when aggravated by tainted milk, the curd will float on the surface of the whey.

I know of no better way to manage such curds than to heat them in the usual way, and as soon as the acid begins to develop, draw the whey, pack the curd, keep it warm, and if it turns spongy and full of pin-holes, then let it lie until a sufficient amount of acid has developed that when ground and pressed the pin-holes will have entirely disappeared. I have let such curds string from the hot iron five inches without any injury to the cheese.

Such cheese when cured will be firm, meaty, of good texture and fine flavored.

Where cows feed on uplands, have tame grasses to eat, and running water to drink, the milk will be of better quality, and when heated will cook easier and be better flavored. Such curds do not require as much acid as the lowland milk.

I am very much in favor of cheddaring cheese, especially in warm weather, for in our factory system where we get a mixture of all kinds of milk, I consider it safer to draw the whey and let the acid develop on the dry curd; it takes the cheese a little longer to cure, but when cured the flavor is more durable.

One mistake some of our factory-men are making is to make their cheese to cure too quickly.

The object is to get the cheese on the market as soon as possible, so as to save care and shrinkage, and that the patrons may get the proceeds sooner. These are good arguments in favor of quick curing.

Such cheese soon gets sharp, and off flavor, and depreciates in value, bringing a loss to the dealer, dissatisfaction to the consumer, and a loss of our reputation abroad for the production of good cheese. Cheese buyers are discriminating more closely now than in times past between good and poor cheese. This we hope may be an inducement to produce a better article, for good cheese always finds ready sale at good prices.

Cut-Worms.

Read before the New York State Agricultural Society at the Annual Meeting, January 21, 1885.*

By J. A. LINTNER, Ph. D.,
New York State Entomologist.

Ever since insect injuries were first talked of and written about in this country, much has been heard of the *Cut-worm*. Its literature, if collected, would probably be as voluminous as that of the Rocky Mountain Locust, *Caloptenus spretus*, a portion of which fills two thick octavo volumes, and a part of a third, of the U. S. Entomological Commission Reports; while the losses resulting from cut-worms, repeated as they are in each successive year, and occurring alike in every portion of the United States, would doubtless exceed those of the above-named insect. Despite the important role they play in agricultural affairs, they are permitted to prosecute their work steadily and persistently, almost unknown, many of them unnamed, and never attaining to the distinguished honor of being made the subject of discussion in a conclave of governors,† or the objects of investigation of a United States Government Commission.

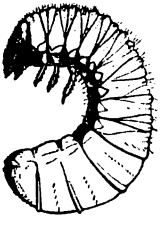


FIG. 1. — The White Grub of LACHNOSTERNA FUSCA (*Frohl.*).

True, more has been charged upon cut-worms than properly belongs to them. The secret manner in which they prosecute their work — under cover of darkness, and often beneath the surface of the ground — rarely permits them to be detected in their opera-

*Some additional matter has been introduced in the present republication.

†At a conference of the Executives of the States and Territories suffering most from Locust ravages, held at Omaha, Nebraska, on October 25 and 26, 1876, the following were in attendance: Gov. Jno. S Pillsbury, of Minnesota; Gov. Samuel Kirkwood, of Iowa; Gov. Thomas A. Osborne, of Kansas; Gov. Silas Garber, of Nebraska; Ex-Gov. Robt. W. Furnas, of Nebraska; Gov. John L. Pennington, of Dakota; Gov. C. H. Hardin, of Missouri; and Prof. C. V. Riley and Prof. Cyrus Thomas, of the U. S. Entomological Commission.

tions, or the injuries inflicted to be unmistakably referred to them.

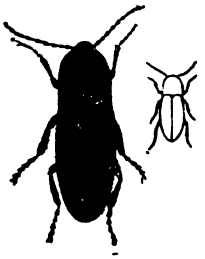


FIG. 2.—The Truncated snapping-beetle, natural size and enlarged.

Roots are eaten and young blades and shoots are cut off, and the unknown depredator, as an easy solution of the mystery, is pronounced a cut-worm. Often in these cases, if proper examination were made, it would be found to proceed from the white grub, *Lachnosterna fusca*, shown in Fig. 1, or one of its many allied forms, or from some species of wire-worm—the larvæ of the "snapping beetles" belonging to the family of *Elateridæ* (two of the beetles are represented in Figs. 2 and 3). Such mistakes should not occur; they are inexcusable. Careful search would rarely, if ever, fail to bring to the light of day the author of these injuries; and when found, certainly after all that has been written and figured and gratuitously distributed upon entomological matters, every intelligent tiller of the soil in which these creatures lurk, should be able to distinguish between a white grub (Fig. 1), a cut-worm (Fig. 4), a wire-worm (Figs. 5 and 6), and a thousand-legged worm (Figs. 7 and 8)—the latter not even a true insect. Until this can be done, inquiry should not be made of how to destroy "the cut-worm," for the reply would be but a random shot fired in darkness.

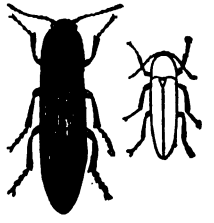


FIG. 3.—The common snapping-beetle, MELANOTUS COMMUNIS (*Gyll.*).

FIG. 4.—The W-marked cut-worm of AGROTIS CLANDESTINA (*Harris*).

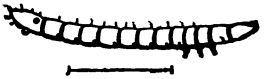


FIG. 5.—Wire-worm of Truncated snapping-beetle.

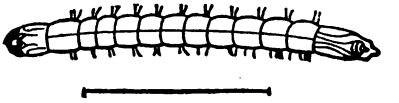


FIG. 6.—The common wire-worm. (After Fitch.)

WHAT ARE CUT-WORMS?

Cut-worms are caterpillars of moths that belong to the great family of *Noctuidæ*, which embraces a large proportion of our night-flying species of Lepidoptera. There are many different species—how many we are not able to state even approximately—

FIG. 7.—Thousand-legged worm, JULUS MULTISTRIATUS Walsh.

as the larvæ of very few of the mature forms (the moths) contained in the genera of *Agrotis*, *Mamestra*, and *Hadena*, to which they mainly pertain, have as yet been ascertained. About 350 United States species have been described in these three genera—*Agrotis*, embracing the larger number, and pre-eminently the Cut-worm genus. Of some of these, their habits are not such as entitle them to be numbered among the Cut-worms proper. We would prefer limiting this designation to forms having the appearance and habits of those known to English writers and agriculturists as *surface caterpillars*, and not extending it to those which seek their food mainly in trees or tall plants. Under such a limitation the class can be somewhat definitely circumscribed.

FIG. 8.—Thousand-legged worm—young and position at rest.

THEIR APPEARANCE.

The following are the principal features of the typical Cut-worms, by the aid of which it will not be difficult to recognize them:

When full grown, they measure from an inch and a quarter to nearly two inches in length. They are sixteen-footed (three pairs of true legs and five pairs of pro-legs or prop-legs), thick, tapering moderately at the extremities, naked and greasy-looking. In color they are dingy brown, gray or greenish, with indistinct, light and dark, longitudinal markings, and occasionally some oblique lines. The head is large, shining and usually red or brown. On the top of the first segment, or ring, is a horny plate, called "the collar" or cervical shield, and on the last, another smaller one, known as the anal plate, both of a shining and darker color than the rest of the body. On each of the segments are six or eight small, blackish humps or dots, each bearing a short hair, as shown in an enlargement of a segment in Fig. 9. When the caterpillar is taken from the ground, or otherwise disturbed, it curls itself into a ring, as represented in Fig. 4, or even more closely than this, with its head resting on its anterior prolegs, and the anal pair upon the crown of the first segment.

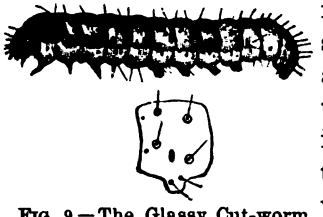


FIG. 9.—The Glassy Cut-worm, HADENA DEVASTATRIX (Brace).

THEIR HABITS.

They are nocturnal in their habits, passing the day in concealment, in holes made by them in the ground among or near the roots of their food-plants, or in other shelter beneath stones, sticks, rails, decomposing leaves and grass, etc. A few of the subterranean species rarely if ever come to the surface, but cut off the tender blades beneath the ground, drawing them in as they are consumed or bearing the excised portion to their retreats to feed upon at leisure. Most of them, however, come forth from the ground after dark (sometimes by day in cloudy and damp weather), and with appetites sharpened by a protracted fast, make vigorous attack upon the young annual plants of the garden or the field, feeding upon their tips, or severing their stalks and destroying far more than they consume. If, during the time of their abundance, search be made for them at night with the aid of a lantern, hundreds of them may be discovered busily occupied in their destructive work. At the approach of day they retire to their hiding places, which may frequently be detected by the hole near the plant, made by them in reëntering the ground.

The time of their greatest injuries is when they are nearly full-grown, in the months of May and June.

Guenée, in his *Histoire Naturelle des Insectes — Species Général des Lépidoptères*, vol. v — Noctuelites, i, p. 258, has remarked as follows, upon the appearance and habits of the larvæ of the genus Agrotis:

Smooth, thick, with transparent skin and of dirty colors, furnished with elevated, shining trapezoidal spots, with the plates of the collar and the anus equally shining, and of a horny consistency, they resemble worms or larvæ of insects far removed from the Lepidoptera. Their manner of living is not less marked. They do not confine themselves to hiding during the day under low plants; but they bury literally in the earth and among their roots, and when night arrives they do not often leave their tomb, except by projecting so much of the anterior portion of their body as is necessary to grasp their food. Several of the species are very destructive, especially by reason of their abundance, as *exclamationis*, *segetum*, *valligera*, *tritici*, *aquilina*, *obelisca*, etc. Their ravages are, however, less serious, by the fact that they usually attack the low plants, as *Plantago*, *Rumex*, *Taraxacum*, and the useless Gramineæ. Nevertheless, they are very dangerous guests of the gardens; it seems, even, that under certain circumstances they attack plants of very different families, and are not opposed to mounting during the night upon woody vegetation

M. Treitschke speaks of the ravages caused in 1833 and 1834, in the vineyards in the environs of Vienna by caterpillars of *aquilina*, which devoured the leaves, the blossoms and the buds, and I have myself seen roses attacked by the caterpillar of *segetum*.

HABITS OF THE MOTHS.

Most of them are nocturnal. A few species fly by day and may be found during the autumnal months feeding upon the nectar of flowers, as upon those of the golden-rod (*Solidago*). But by far the larger number come abroad only at night to feed, passing the day, in sleep probably, in various hiding places, as in crevices of walls, piles of wood and stone, under the bark of trees, behind closed blinds of dwellings where they have been attracted during the evening by lights—in short, in any dark, secluded place or crevice into which their closely-folded wings permit them to creep. Their entrance into crevices or apertures apparently too small for their admission, is facilitated by the habit belonging to many of the species of folding their front wings one over the other by the overlapping of their inner margin, and holding them almost parallel to the plane of position. In this attitude the greatest breadth of the moth across the folded wings exceeds but little the diameter of the body.

FIG. 10.—AGROTIS SUBGOTHICA, the Gothic Dart-Moth. (After Fitch.)

Although strongly muscular in their build, and capable of vigorous flight, when driven up from their concealment they fly but a short distance before they alight and seek a hiding place—much after the manner of the *Hesperidæ* among the butterflies, commonly known as "skippers." Fig. 10 shows one of the common species, the Gothic Dart-Moth, *Agrotis subgothica* (Haworth).

NATURAL HISTORY.

From the differences observed in the species known to us, it is not possible to give a satisfactory account of the life-history of cut-worms as a class. They require to be separately discussed. It may be stated, however, that the eggs from which the caterpillars proceed are placed usually upon some low plant, whence the young when hatched may easily reach the food that they require. It was formerly supposed, by Kollar and others, that the eggs were laid in the ground, but we are not aware of any

reliable testimony of their having been found in such places, while of some species the eggs have been discovered in locations quite removed from their natural food-plants, as upon the leaves and twigs of trees not known to be frequented by the larvæ, as are, at times, the eggs of *Agrotis saucia* (Hubn.), as shown in Fig. 11. The usual time for egg-deposit is the latter part of summer. Hatching soon after, early in the autumn, the larvæ enter the earth and commence to feed upon the tender roots of various plants — upon almost any kind that they encounter, as at this stage of their life they are very general feeders. At the commencement of winter as the frosts penetrate to their abode and chill them, and they have become about half grown, they descend into the ground to the depth of six or eight inches or even not so deep. Here they shape for themselves an oval cavity, within which they curl up in a torpid state for their winter's sleep. Freezing fails to harm them if undisturbed in their retreats. In the spring, when the frost leaves the ground, they awaken to activity, ascend to near the surface, and resume their feeding upon the roots of the starting vegetation. With their rapid growth, they soon attain to the size and strength that permits them to travel through the ground with ease in search of the particular food most agreeable to them.

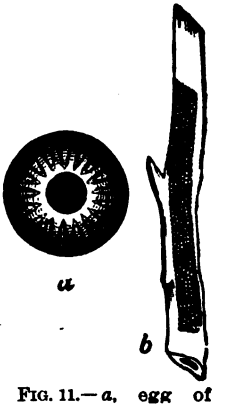


FIG. 11.—*a*, egg of AGROTIS SAUCIA, greatly enlarged; *b*, eggs of the same deposited upon a twig, natural size.

When full-grown they again descend into the ground to a greater depth than before, and within a compacted cell, made by packing the earth with their head, after the few days required to produce the change, throw off the caterpillar skin and become smooth, dark-brown pupæ. The pupal stage may average three or four weeks, when the moth issues from the rent pupal case and makes its way to the surface. During the brief life of the winged insect, which lasts only for two or three weeks, if not sooner terminated by one of its many enemies, the sexes come together, eggs are deposited for another brood, a moderate amount of food is partaken of in the nectar of flowers or other sweet substance, and the life-cycle is completed. A similar round, only much shortened in duration, and with continued progress, in some cases follows and is completed during the summer, but as a rule only a single brood of cut-worms is produced during the year.

In some of the species — in *Mamestra trifolii* (Rott.) and others, the life-history, as above given, differs, in that the hibernation is not in the larval stage, but as a pupa. The larvæ complete their growth in the autumn and enter upon the pupal stage in October and November. The moths of these species are those which are the first to appear abroad in the spring. [*Mamestra trifolii* is illustrated in Fig. 12, in three of its stages.]

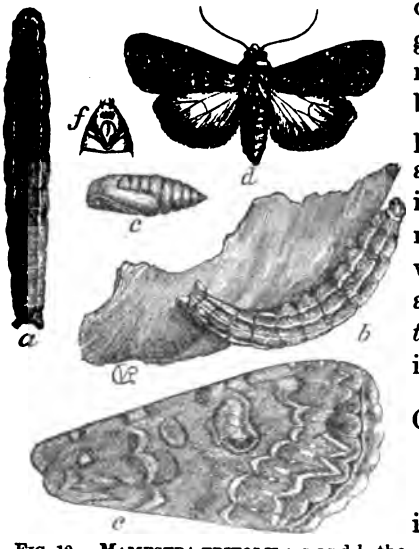


FIG. 12.— MAMESTRA TRIFOLII ; *a* and *b*, the Clover Cut-worm; *c*, pupa; *d*, moth; *e*, enlarged wing of the same; *f*, anal segment of the pupa.

CONDITIONS FAVORABLE TO CUT-WORMS.

The abundance of cut-worms is not dependent upon, or materially influenced by, the character of the soil. They are known to occur alike in gravelly soil, in loam, in clay, in sand, upon uplands and in alluvial bottoms. Their number does not appear to be increased by a high degree of fertility, for a cold and sterile location serves them as well, so long as it provides them with the requisite food-supply. Dr. Fitch states that he never found them more plenty than on one occasion among beans planted upon a hill-side, so barren that it was thought nothing else could be raised thereon. Nor does the kind of manure applied to the land seem to have any influence, except as it induces a more succulent plant-growth. A writer states, that he finds them more numerous on dry rolling ground. That this may not be accepted as the rule, appears from the statement of another, who says, "it has been observed that they damage crops more especially on wet lands," and he therefore recommends draining as a remedy.

With some of our insect pests, soil-conditions and character have much to do. Thus, we have recent evidence to lead us to believe that the rose-bug, *Macrodactylus subspinosus* breeds in wet, sandy land, and that a clayey soil is almost a preventive of its ravages. But with the ubiquitous cut-worm the soil is a matter of indifference — the vegetation that it bears, all-important. The

parent moth, with provident instinct, selects the locality for the deposit of its eggs that offers the most desirable food for its rapacious progeny.

Experience dearly bought, has taught us the food that they prefer, and its attendant conditions. A corn-field upon a newly turned sod is the metropolis of the cut-worm, while corn upon clover stubble, oat stubble, and wheat stubble, are places where they love to congregate.

THEIR FOOD-PLANTS.

In treating of so large a group of insects, and especially, one in which the several species are almost indiscriminate in their tastes, it can serve no useful purpose to present a list of all their known food-plants. A reference to such as suffer the most severely from their depredations, will be sufficient for the present paper.

Grass.— The amount of injury to grass lands from cut-worms, can only be conjectural, associated as it usually is with those of the white grub and allied species, wire-worms, the larvæ of the *Tipulidæ* or crane-flies, and of numerous other insects. It is, however, very great, for the first half of the active life of many of the species, is believed to be largely sustained by the food found in the roots of the various grasses — only taking upon themselves the true cut-worm habit when the coming of the young corn, cabbage, and tender garden vegetable invites, after their winter's rest, their greedy and wasteful attack. The extent to which they infest grass lands, is shown in the well-known experience that rarely if ever, is cut-worm attack so serious and so noticeable, as when corn is planted upon a newly-broken-up sod.

Corn.— The fondness of the cut-worm for corn, the most succulent of our grasses, has become proverbial; hence we have the following old distich giving the number of kernels to be planted in a hill:

> "One for the black-bird and one for the crow,
> Two for the cut-worm and three to grow."

Rarely is a corn-field exempt from its presence. Resulting at times only in a permissible, and perhaps, desirable thinning, yet frequently it compels an entire replanting. The extent of its injuries in some instances will be mentioned hereafter.

The following species, among others, are recorded as preying upon corn: *Agrotis clandestina*, *A. c-nigrum*, *A. subgothica*, *A.*

herilis, *A. messoria*, *A. saucia*, *A. tessellata*, *A. ypsilon*, *Hadena arctica*, *H. devastatrix*, *Laphygma frugiperda*, and *Nephelodes violans*. [Of these, *Agrotis clandestina* and *Hadena devastatrix*, two of the most common of the Cut-worm moths, and the most destructive to corn, are shown in Figs. 13 and 14.]

FIG. 13.— AGROTIS CLANDESTINA.

FIG. 14.— HADENA DEVASTATRIX.

Wheat.— Wheat is often injured to a serious extent by a species for a long time only known to us as a dingy-brown larva, with a conspicuous yellowish-gray band upon its sides. In several localities its attack had only been observed in instances where the wheat had been sown upon oat stubble (*American Entomologist*, i, 1868, p. 59). The larva was subsequently ascertained by breeding it, to be that of *Laphygma frugiperda*. Professor Riley had described it as the Wheat Cut-worm, in his first Missouri report. At the present time it is more generally known as the Army Cut-worm, from the abundance in which it at times occurs. For representation of the moth, see page 83.

The European wheat fields often suffer enormously from two species, viz.: *Agrotis tritici*, the wheat dart-moth, and *Agrotis segetum*, the common dart-moth, which feed upon both the roots and leaves of winter wheat.

Barley.— A cut-worm, identified as *Agrotis declarata* Walker, caused considerable injury to barley fields (to oats also), in Manitoba, during the month of July of the year 1884. (Saunders, *Canad. Entomol.*, xvi, 1884, p. 206.) It is described as grayish-brown, with a semi-transparent skin, a brown horny head, and a shield of the same character on the upper part of the second segment; a pale line down the back, two similar lines along each side, and a white band lower down, close to the under surface.

Cabbage.— In a garden in Normal, Ill., containing 600 young plants, not over thirty escaped. The larvæ came out of the ground (in the middle of April), and cut off the plants at or near the surface, and then ate the leaves. The owner killed about 200 of the worms on the first day of their appearance, and 500 or more on the day following, after which the plot was reset with

late cabbages. The cut-worm was found to be *Agrotis annexa* (Treits.), shown in Fig. 15, in its three stages of larva, pupa and moth. (Forbes, *Twelfth Report of the Insects of Illinois*, 1883, p. 103.)

In another locality, of 500 cabbage plants and 300 tomato plants set out a week later, but about 200 of each had escaped the cut-worm. A resetting shared the same fate. At least 500 worms were taken and killed from the cabbage plot, leaving them still numerous. (*Country Gentleman*, June 24, 1875, p. 392.)

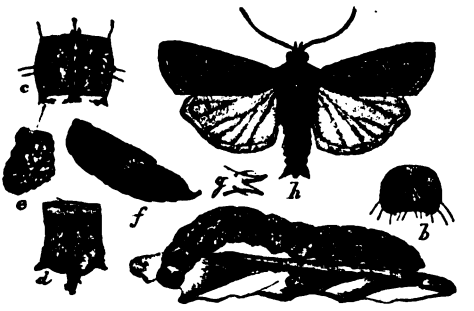


FIG. 15.—The Cabbage Cut-worm, AGROTIS ANNEXA: *a*, larva feeding; *b*, head; *c*, *d*, dorsal and lateral views of a middle joint, enlarged; *e*, portion of skin more enlarged to show spinous surface; *f*, pupa; *g*, enlarged anal tip of pupa; *h*, male moth.

A writer, inquiring for a remedy for the cut-worm so destructive to young cabbage plants, states incidentally, that *one-half or more of the young plants are cut down* in early spring, especially if the nights following their setting are cool or damp.

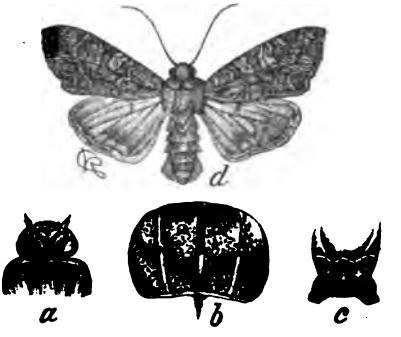


FIG. 16.—MAMESTRA SUBJUNCTA: *a*, head and collar; *b*, a middle joint; *c*, the anal shield; *d*, the moth.

Of the species preying upon cabbage are: *Agrotis clandestina*, *A. saucia*, *A. annexa*, *A. messoria*, *A. malefida*, *A. ypsilon*, *Mamestra subjuncta*, *Mamestra trifolii*, *Hadena devastatrix* and *Laphygma frugiperda*. *Mamestra subjuncta* (Gr.-Rob.), is illustrated in Figure 16 as one of the most injurious of the species to cabbage.

Turnips.— A favorite method of attack upon the turnip is to eat into and around the neck of the plant, until it is detached, or to eat off separate leaves and drag them into the hole beside the plant, to feed upon during the daytime. The turnip crop in England is more liable to cut-worm attack than is the crop in our country, the principal depredators being *Agrotis exclamationis* Linn., *Agrotis segetum* Ochs., *Mamestra brassicæ* Linn., and *Triphœna pronuba* (Linn.).

Onions.— Upon four acres of ground in Chautauqua Co., N. Y., onions had been cultivated for sixty years. In one of these years, the plot was sown and weeded out the second time, all standing well. The cut-worms commenced their work, and notwithstanding bushels of them were killed they cut off every onion, and on the fourth of July the land was plowed up for another crop.

Probably the most severe attack upon onions is that which was reported from Goshen, Orange Co., N. Y., early in June of 1885. A cut-worm was found to be rapidly destroying the crop, and to threaten the extinction in that vicinity of an industry, the annual value of which was stated to be half a million of dollars.

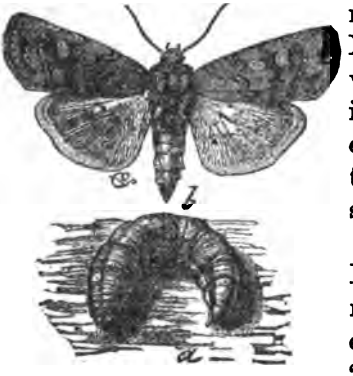


FIG. 17.— AGROTIS MESSORIA: the larva and moth.

The attack was investigated by the Entomological Division of the Department of Agriculture, and the insect engaged in it ascertained to be the "Dark-sided Cut-worm" *Agrotis messoria* Harris, represented in Figure 17, together with the moth that it produces. So abundantly did the worm occur, that according to the report of Mr. J. B. Smith made to the Department, "three little girls had picked in the morning a three-quart pail full. In one spot, less than fifteen inches square, forty full-grown larvæ were taken." In another report it is stated: "It is common for a family to pick ten or twelve quarts by day, and the same number at night by the light of lamps. These most industrious people have to work day and night to keep down these pests and save their crops." (See Professor Riley's Report in the *Ann. Rept. Commis. Agricul.*, for 1885, pp. 270–275.)

The crop in this locality suffered also severely from the above attack the following year (1886). The usual annual yield of the onion fields of Orange county, of from 500,000 to 600,000 bushels, was, it is estimated, reduced one-half (*Country Gentleman* for October 7, 1886, p. 750).

Beans.— The tender stems of young beans furnish tempting food, and every gardener knows the frequency with which the young plants are found in mornings with the stem severed in such a manner, as to leave no doubt of the presence of the cut-worm. The W-marked Cut-worm, *Agrotis clandestina* (Harris), is a common

depredator upon this plant. Dr. Fitch also describes the "Black-headed Cut-worm" as very destructive to beans, cutting them off slightly below the surface, and dragging the severed stem into the ground, where it buries itself, and there feeding upon it during the day, till the whole is devoured, or only pieces of the wilted leaves remain, plugging up the entrance to the hole (*First and Second Reports Ins. N. Y.*, p. 313).

Strawberries.— Mr. Wm. Saunders reports a severe attack of a species of *Agrotis* — the particular species is not named, although a full description of the larva and a brief one of the moth are given — upon plantations on the borders of Lake Huron, near Sarnia. The caterpillars manifested an especial fondness for the foliage of the strawberry, and notwithstanding the most vigilant search for them night after night, after they had been discovered as the depredators, and the collection and destruction of large numbers of them, they defoliated large patches of the vines to such an extent that they were utterly ruined. Nearly all through the month of June they literally swarmed, and scarcely a night passed without material damage from them. In one night, 1,800 of the caterpillars were killed by Mr. Mounjoy upon his beds (*Second Annual Report of the Entomological Society of Ontario*, for 1872, pp. 21, 22).

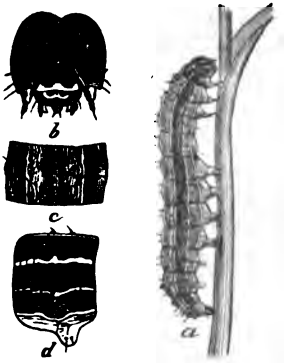


FIG. 18.—The Army Cut-worm, LAPHYGMA FRUGIPERDA, with enlargements of head and a segment.

Agrotis fennica, at an early stage in its phenomenal appearance in the spring of 1884, while but one-half inch in length, was found in Canada, by Mr. James Fletcher in large numbers, beneath strawberry plants, upon which they were feeding.

In the Southern States, *Laphygma frugiperda* (Sm.-Abb.), known there as the "Grass worm," has been injurious to strawberries (*Rept. Comm. Agricul.* for 1882, p. 138). It is shown in Figure 18.

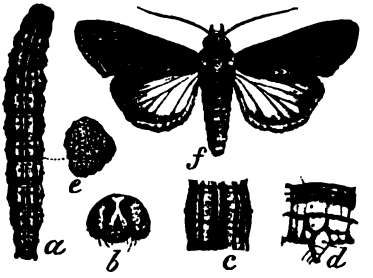


FIG. 19.—AGROTIS MALEFIDA: *a*, larva; *b*, its head enlarged; *c*, *d*, dorsal and lateral views of a middle joint; *e*, highly enlarged surface of skin; *f*, the moth.

Hops.—The operations of different cut-worms have frequently been observed on hop-vines, and they have

been turned up in the ground about the plants. So far as we know, but one of the species has been identified. It was found by Mr. Bennett, at Newton, N. J., feeding destructively on his vines and those of his neighbors. Sent to the Division of Entomology at Washington, it was ascertained to be *Agrotis malefida* Guen. — a species which is of more common occurrence in the Southern States than to the northward. In this instance, its injuries were arrested by dusting the vines with a powder made of gas-tar and lime. (*Bull. No.* 11. *Divis. of Entomol.— U. S. Dept. Agricul.*, 1886, p. 31.)

This cut-worm has also been found to be injurious to cabbage, and to a number of other plants. It is illustrated n Fig. 19.

Tobacco.—Young tobacco plants are often cut off in the month of June. In West Meriden, Conn., three thousand plants were set out on June 22d. The next morning, from one row of one hundred and eighty plants two hundred and fourteen cut-worms were taken. Dr. Fitch records the fact of their particular fondness for this plant. He states: "I set out in my garden a few tobacco plants that I might notice what insects would come upon this filthy weed; and within a few days after, one of these cut-worms gave me a very palpable reminder that he would not tax me for cabbages and beans if I would only furnish him with what tobacco he wanted to chew" (*Sixth-Ninth Reports Ins. N. Y.*, 1865, p. 243).

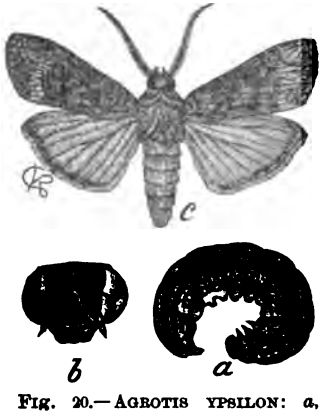


FIG. 20.—AGROTIS YPSILON: *a*, larva; *b*, enlarged head of same; *c*, the moth.

Figure 20 shows "the Black Cut-worm," and the moth that it produces, *Agrotis ypsilon* (Rott.), which is one of the species from the attack of which tobacco plants are known to have received severe damage.

Clover.—In the Ottawa district of Ontario, during the month of May, 1884, a cut-worm was discovered in large numbers and proving very injurious in clover fields. It was at first believed to be the army-worm, but upon rearing some of them to the perfect state, they proved to be *Agrotis fennica* (Tausch.) (Saunders, *Canad. Entomol.*, xvi, p. 204). *Agrotis malefida* Guen., also feeds on clover (Riley *in Rept. to Comm. Agricul.* for 1884, p. 292).

Cotton.— Early cotton — February planted, is frequently damaged by different species of cut-worms, particularly by the Cabbage Cut-worm, *Agrotis annexa* (Treits.). (*Bulletin* No. 1, *Dept. Agricul.— Div. Entomol.*, 1883, p. 44.) *Laphygma frugiperda* (Sm. Abb.) is also injurious to cotton, according to Glover, who has illlustrated the insect in its different stages, and its earthern cocoon, in plate 9 of his MS. Notes.— Cotton, under the name of the "Grass worm."

Smilax.— This beautiful and delicate twiner, *Myrsiphyllum asparagoides*, has been injured by the Variegated Cut-worm, *Agrotis saucia* (Hübn), which has attacked it in conservatories in Lowell, Mass., and eaten off the softer parts and especially the top of the plant (*American Entomologist*, 1880, iii, p. 298). The worm and its moth are represented in Fig. 21. It is one of our commonest cut-worms, which is ever ready to attack almost any kind of tender vegetation, and has often been known to climb vines and feed upon their foliage. The moth was for a long time known as *Agrotis inermis* Harris, but later was ascertained to be identical with the *A. saucia* (Hübn.), of Europe.

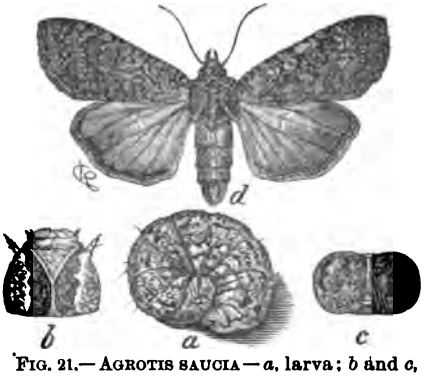


FIG. 21.— AGROTIS SAUCIA — *a*, larva; *b* and *c*, head and a middle point of the same, enlarged; *d*, the moth.

Flowers.— In a bed of hyacinths, at Buffalo, N. Y., just as the flower buds had commenced to open, the flower-scapes were cut off — hardly one in five remaining.

Mr. William Saunders has noticed a special fondness of cut-worms for pansies. "Many fine plants of this flower of the previous year's growth were found, early in the season, eaten close to the ground, both leaves and stalks, and from about the roots of a single plant from thirty to fifty of the nearly full-grown larvæ were taken (*Canadian Entomologist*, 1880, xii, p. 189).

A gentleman writing for a cut-worm remedy, from Greenwich, R. I., states that nasturtiums, phlox, and carnations had suffered severely. Dr. Harris mentions asters, balsams, and pinks as often shorn of their leaves and of their central buds by these concealed spoilers (*Ins. Inj. Veg.*, p. 443).

Some beds of phlox bordering a carriage-way in New Jersey,

were found by Mrs. Mary Treat very attractive to cut-worms. "Untold numbers" were discovered feeding upon them when examined with a light in the evening, and upon turning over some of the ground beneath them, in one search over a pint of the worms were taken, from just beneath the surface (*Proc. N. J. St. Horticul. Soc.*, at 8th Meeting, 1883, pp. 88–9).

Among other garden and field crops which are liable to cut-worm attack, are peas, beets, potatoes, tomatoes, pumpkins, melons, and squashes.

ABUNDANCE OF CUT-WORMS.

As with other insects, these have their years of unusual abundance, for which we are not able to assign a satisfactory cause. Sometimes a single species only has multiplied, and one that had never before been known as injurious, as with the Bronze-colored Cut-worm, *Nephelodes violans*, in Northern New York, in the spring of 1881, and with the recent phenomenal appearance of the hitherto rare *Agrotis fennica*, in Northern Michigan and in Canada, in 1884. At other times all of the well-known species make their appearance in such force that it is next to impossible to interpose effectual resistance against their onslaught.

A few instances of their occasional abundance may be cited:

More than thirty cut-worms have been found around one hill of cucumbers.

In Sullivan county, Tenn., as many as sixty have been dug from a single hill of corn (*Report Commis. Agricul. for* 1872, p. 122).

"Bushels," are reported as having been taken from a large onion field.

Dr. Harris copies the statement without questioning it, although seeming almost incredible, that sixty bushels of mold taken from a buckwheat field where *Agrotis tritici* prevailed, contained twenty-three bushels of the caterpillars.

LITERATURE OF THE CUT-WORMS.

Dr. Harris, in the first edition of his admirable report, published in 1841, and entitled "A Report on the Insects of Massachusetts Injurious to Vegetation," prefaces his discussion of cut-worms, occupying fourteen pages, with this brief summary of the general ignorance of them at the time of his writing: "Numerous complaints have been made of the ravages of cut-worms among corn, wheat, grass, and other vegetables in various parts of the country

After a tiresome search through many of our agricultural publications, I have become convinced that these insects and their history are not yet known to some of the very persons who are said to have suffered from their depredations."

Dr. Harris has given briefly their general habits, and refers them to the group of Noctuid moths known as *Agrotidians*, of which he presents the prominent features and characteristics. From a considerable number of cut-worms collected by him during the months of June and July, scarcely differing in appearance from one another, five different species of moths were obtained. One of these was the *Agrotis devastator* of Brace, and the other four were described and named by him as *Agrotis telifera*, *Agrotis inermis*, *Agrotis messoria* and *Agrotis tessellata;* of these the first two have since been found to be identical with *Agrotis ypsilon* Rott. and *Agrotis saucia* Engr. Quoting from letters of Dr. F. E. Melsheimer upon the "Corn Cut-worm," he gives additional observations of his own upon it, and names it *Noctua clandestina.* Several remedies for these pests are proposed and quoted from other writers. Another species, which cuts off the leaves of roses, currant bushes, and other shrubs and even young trees, is referred to *Hadena amica*, described by Stephens, as rare in England, but which had been previously described by Dr. Boisduval as *Hadena arctica.*

In the *Second Report on the Insects of New York* (*Trans. N. Y. State Agricultural Society* for 1855, xv, pp. 542–550, and pp. 310–318 of the First and Second Reports, published in 1856), Dr. Fitch treats of the cut-worms — "the larvæ of different species of *Agrotis* that sever the young stalks of Indian corn by night at or near the surface of the ground." The moths that they severally produce were still unknown, as no success had attended the efforts to rear the larvæ in confinement. Five kinds had been observed by him preying upon corn, which he briefly describes, with their habits, under the names of the Red-headed Cut-worm (cutting the plants below the surface of the ground), the Striped Cut-worm (cutting the plants half an inch above the ground), the Faintly-lined Cut-worm (more common among onions and cabbages), the White Cut-worm (rare among corn and beans), and the Black-headed Cut-worm (destructive to beans, cutting them below the surface and drawing the severed stem into its hole). Three species of Cut-worm Moths are also described, figured and their habits given, viz.,

Agrotis subgothica (see Figure 10), *Agrotis devastator* (a *Hadena*, Figure 14), and *Noctua clandestina* (an *Agrotis*, Figure 13). As natural enemies of the cut-worm, the crow, the larva of one of the ground beetles — *Harpalus caliginosus* (see Figure 26, p. 88), and a hymenopterous insect like the black wasp, are mentioned. Useful preventives and remedies are thick planting, digging out by hand, and trapping in holes.

In Dr. Fitch's *Ninth Report on the Insects of New York* (*Trans. N. Y. State Agricultural Society* for 1863, xxiii, pp. 804-817, and *Sixth to the Ninth Reports*, 1865, pp. 237-250), in connection with general remarks upon cut-worms, the "Corn Cut-worm" is treated of in minute detail of description, habits, etc., under the name of *Agrotis nigricans* var. *maizi*. The species has since been identified as *Agrotis tessellata* Harris. It is represented in Fig. 22, in its natural position at rest, and with wings expanded in flight.

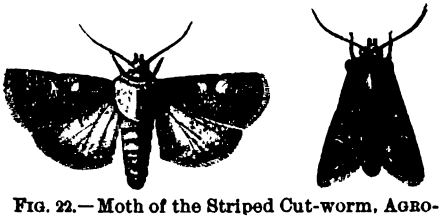


FIG. 22.—Moth of the Striped Cut-worm, AGROTIS TESSELLATA. (After Fitch.)

A like minute account of the "Yellow-headed Cut-worm" is given, from which "*Hadena amputatrix*" of the Third report, was reared, now known as *Hadena arctica* Boisd.

The larva of a common carabid beetle, *Calosoma calidum* (Fabr.), shown in Figure 25, page 87, is also described and figured, as one of the most efficient destroyers of cut-worms. Its method of attacking, killing and devouring its prey is graphically detailed, and characterized as "one of the most interesting and wonderful exhibitions of insect economy which the world affords."

Mr. B. D. Walsh, in the *Practical Entomologist* for June, 1886, i, pp. 85–6, has devoted about two pages to the habits of cut-worms, and notice of four species of *Agrotis* and two of *Hadena*. An account by Mr. Cochran of some climbing cut-worms in Illinois is quoted, and mention made of a species infesting vineyards in California, and causing serious loss by cutting off the stem of the leaf.

On pages 64–66 of vol. ii of the same publication is an article entitled "Do Cut-worms destroy tree-buds?" where the affirmative observations of the writer are given, together with some expedients adopted for the destruction of these creatures.

In the *First Annual Report on the Insects of Missouri*, published in 1869 (pp. 67–91), Prof. Riley adds materially to our knowledge of these insidious depredators, in an article entitled "Cut-worms: The Natural History of Twelve Distinct Species." Of these, four are described as "climbing cut-worms," from their habit of ascending trees at night to feed upon the buds and leaves. They have been found abundantly upon apple and pear trees, especially upon the dwarf varieties and upon grapevines, preying upon the buds. They also attack the blackberry, the raspberry, currant, and rose bushes.

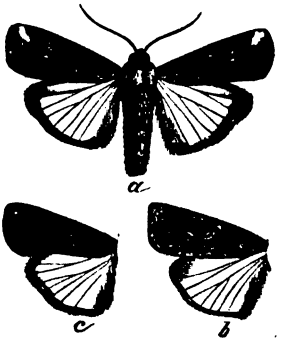


FIG. 23.—LAPHYGMA FRUGIPERDA and varieties.

The transformations of ten species are given, together with figures and descriptions of the caterpillar and the moth; and two other species, previously described in their several stages by Dr. Fitch, are referred to. A wheat cut-worm is also described and history given, which subsequently proved to be *Laphygma frugiperda* Guenée. The moth is shown in Figure 23, and its larva in Figure 18. The natural enemies and remedies for these destructive creatures close the notice.

Dr. Packard, in his *Guide to the Study of Insects*, 1869 (pp. 305–310), introduces figures of a few of the more common species, and quotes from the writings of Dr. Harris and Prof. Riley.

In the *Seventh Annual Report on the Insects of Illinois*, published in 1878 by Dr. Cyrus Thomas, Prof. G. H. French presents, in connection with his study of corn insects, a paper of twenty pages (pp. 81–100) upon the Cut-worms of the Field and Garden. Some general remarks upon these insects are followed by mention of natural and artificial remedies and by remarks upon the habits and characteristics of twelve species.

In the same report (pp. 202–219) Prof. French has given a second notice of cut-worms, in which descriptions of the moths of fourteen species appear, and of the larvæ of most of them, together with observations upon the habits, etc., of several of the species made by himself and by Mr. C. E. Worthington, of Chicago, Ill.

In the *Report of the Entomological Society of Ontario* for the year 1879, pp. 37–46, is a paper on "Canadian Cut-worms," by Mr. G. J. Bowles, of Montreal, in which twelve species are noticed,

described, and habits recorded of some, and remedies given. They are nearly all those which had been previously treated of by Professor Riley.

In an article entitled "Cabbage Cut-worms," contained in the Report of the Entomologist to the Commissioner of Agriculture, for the year 1884, Professor Riley has given a brief account of cut-worms in general, the best approved remedies for them, and excellent notices, averaging over a page each, of eight species that depredate on the cabbage, each of which is finely illustrated, as may be seen from the figures, which, through the kindness of the Commissioner of Agriculture, we have been able to present in the present paper.

The above are, we believe, the principal publications upon cut-worms accessible to the general reader. Reference to several other writings upon those which are injurious to Indian corn, may be found in a paper prepared by Mr. Thomas F. Hunt, and published in *Miscellaneous Essays on Economic Entomology*, by the State Entomologist of Illinois and his assistants, 1886, pp. 64-66.

LIST OF SPECIES.

As previously stated, no approximation to a full list of our cut-worms can as yet be given, since the larval stage and habits of so few of the species of *Agrotis*, *Mamestra*, and *Hadena*, are yet known. It would not be safe to presume, to any extent, upon a genetic identity of habits, since marked differences have been observed. For example, *Agrotis c-nigrum* (Linn.) and *A. bicarnea* (Guen.), according to Mr. S. L. Elliott, have been seen feeding by day, without any concealment, on chicory, *Cichorium intybus*. *Mamestra picta* Harris, the zebra cabbage worm (shown in Figure 24), feeds exposed, in dense clusters, when young, upon several of its food-plants, scattering with age, but continuing to feed by day without

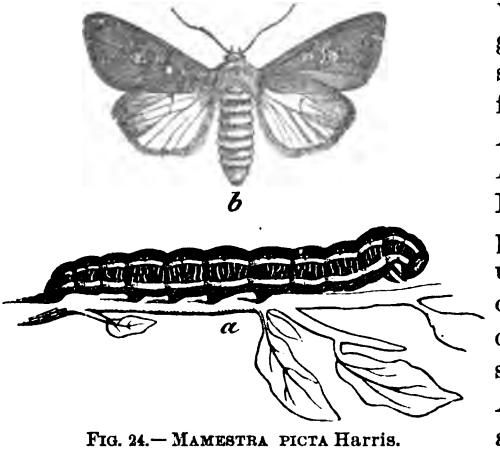


FIG. 24.—MAMESTRA PICTA Harris.

concealment. *Hadena adjuncta* Boisd., has not cut-worm habits, but finds its food at all hours of the day in the blossoms of the golden-rod (*Solidago*). *Hadena turbulenta* (Hübn.) feeds socially on *Smilax* at times, so abundantly as to defoliate it.

The following are the species of cut-worms, so far as known to me (twenty-eight in number), occurring in the State of New York:

The Spotted Cut-worm	Agrotis c-nigrum (*Linn.*).
	A. bicarnea (*Guen.*).
The Streaked Cut-worm	A. haruspica *Grote.*
	A. baja (*S. V.*).
The Black-lined Cut-worm	A. fennica (*Tausch.*).
The Dingy Cut-worm	A. subgothica (*Haw.*).
	A. tricosa *Lintn.*
The Western Striped Cut-worm	A. herilis *Grote.*
The White-headed Cut-worm	A. plecta (*Linn.*).
The Grape-bud Cut-worm	A. cupida *Grote.*
The W-marked Cut-worm	A. clandestina (*Harris*).
The Dark-sided Cut-worm	A. messoria *Harris.*
The Striped Cut-worm	A. tessellata *Harris.*
	A. declarata (*Walk.*).
The Cabbage Cut-worm	A. annexa (*Treits.*).
The Shagreened Cut-worm	A. malefida (*Guen.*).
The Black Cut-worm	A. ypsilon (*Rott.*).
The Variegated Cut-worm	A. saucia (*Hübn.*).
The Grass-green Cut-worm	A. lubricans (*Guen.*).
The White-bristly Cut-worm	Mamestra renigera (*Steph.*).
The Speckled Cut-worm	M. subjuncta (*Gr.-Rob.*).
The Clover Cut-worm	M. trifolii (*Rott.*).
The Yellow-headed Cut-worm	Hadena arctica *Boisd.*
The Glassy Cut-worm	H. devastatrix (*Brace*).
	H. lignicolor (*Guen.*).
	H. sputatrix *Grote.*
The Army Cut-worm	Laphygma frugiperda (*Sm.-Abb.*).
The Wheat Cut-worm	Prodenia commelinæ (*Sm.-Abb.*).
The Bronze-colored Cut-worm	Nephelodes violans *Guen.*

In a revision of the present paper, it is proposed to notice each of the above species in some detail, presenting figures (of many), their synonomy and references to publication, descriptions of the caterpillar and moth, habits, time of appearance, and geographical distribution.

The following species, there is reason for believing, may be added to the above list, when their larval habits are ascertained:

Agrotis Normaniana *Grote.*	Mamestra confusa (*Hübn.*).
Agrotis alternata *Grote.*	Mamestra lorea (*Guen.*).
Agrotis prasina (*Fabr.*).	Luceria passer (*Guen.*).
Mamestra mucens (*Hübn.*).	Hadena apamiformis (*Guen.*).

Hadena verbascoides (*Guen.*).
H. cariosa (*Guen.*).
H. sectilis (*Guen.*).
H. vulgaris (*Gr.-Rob.*).
Hadena finitima (*Guen.*).
Hyppa xylinoides *Guen.*
Helotropha reniformis *Grote.*
Apamea nictitans (*Linn.*).

NATURAL ENEMIES.

As would naturally be expected from their numbers, their size, and their smooth bodies, the cut-worms have many natural enemies, whose persistence in seeking for them and making them their prey, greatly mitigates the injuries that their unchecked increase would otherwise inflict upon us. Of these, only a few will be referred to in this paper.

The nocturnal habits of most of the species render them much less liable to become the prey of our insectivorous birds than those that feed by day without concealment, yet they are far from enjoying entire immunity.

The Robin. — Foremost among the birds as a cut-worm destroyer, the robin (*Merula migratoria*) claims position. Mr. F. H. King, in his *Economic Relations of Wisconsin Birds*, forming chapter xi of vol. 1 of the *Wisconsin Geological Survey* (1883), has written as follows of it:

"Its eminently terrestrial habits, its fondness for larvæ of various kinds, and its ability to obtain those which are hidden beneath the turf, give it a usefulness in destroying cut-worms which no other bird possesses in the same degree, and for this feature in its economy alone, its greater abundance should be encouraged.

"Early in the morning, and toward the close of the evening, the Robin may often be seen searching after cut-worms in lawns, pastures and meadows, and when thus engaged, it hops about gazing apparently more at distant objects than searching for something near at hand; then, suddenly, it commences tearing up the old grass and turf with its bill; and, in another instant, it stands triumphant with its wriggling prize in its bill, for it rarely digs in vain. I have seen a Robin capture in this manner five cut-worms in less than ten minutes; and five other birds within view were doing the same work. * * * How the Robin discovers these cut-worms is not easily explained. It is possible, however, that the larvæ, while gnawing at the bases and roots of the grass stems, while secreting themselves after their night's raids, or while, toward evening, they grow restless and hungry, the slight movements which they produce among the grass are sufficient to betray their

hiding places to the Robin. It should be observed in regard to these cut-worms, that large numbers of them are destroyed by various birds just after showers and during cool, drizzly and lowery days, when the absence of the scorching rays of the sun, enables them to feed with quite as much comfort as during the night.

"From the stomach of one Robin were taken seven cut-worms, 1.25 inch long."

Prof. Forbes, State Entomologist of Illinois, in the examination of the contents of the stomachs of nine Robins, made during the month of May, found that cut-worms were extraordinarily prominent in their food, making twenty-eight per cent of the whole. Half of them consisting of a single large injurious species, *Nephelodes violans* (*Bulletin No.* 6, *Illinois State Laboratory of Natural History*, 1882, p. 4).

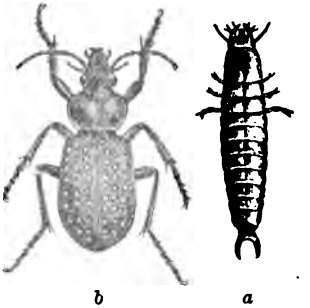
The Cat bird.—The same food has been found in the stomach of this species, *Mimus Carolinensis* L. (*id.*, *ib.*).

In the examination of the stomachs of several young Cat-birds, Mr. C. M. Weed determined sixty-two per cent of the contents to be larval noctuids, and mainly of cut-worms (*Note from the Entomological Laboratory of the Michigan Agricultural College*, 1884, p. 21).

The Red-winged Black bird.—Prof. Forbes has also taken cut-worms from the stomach of this bird, *Agelæus Phœniceus* L., in Illinois.

The Purple Grackle.—Mr. King notes of this Grackle, *Quiscalus purpureus*, that it often follows the plow in quest of grubs and cut-worms (*loc. cit.*, p. 552).

Poultry.—Chickens, especially, are very efficient destroyers of cut-worms, in gardens, where they search for, and are quick to discover, them in the upturned ground. A large orchardist has stated that he would not have been able to cope with the worms that attacked his trees without availing himself of the services of a large brood of chickens procured for the purpose (*First Report of the Insects of Missouri*, p. 90).



b *a*

FIG. 25.—CALOSOMA CALIDUM: *a*, the larva; *b*, the beetle.

Calosoma calidum (Fabr.).—The larva of this ground-beetle, previously referred to on page 82, which preys upon many

different species of caterpillars, is so destructive to cut-worms, attacking them with so much energy, even if the worm be twice its size, that it has been designated by Dr. Shimer as the "Cut-worm Lion." Figure 25 represents the insect at *a*. For an interesting account of the operations of this powerful and ferocious larva, in searching for the cut-worms that constitute so large a portion of its food, its manner of seizing the worm, and its subsequent combat with it, see Dr. Fitch in *Sixth–Ninth Reports on the Insects of New York*, pp. 249-250.

Harpalus caliginosus (Fabr.).—The larva of this species is also a persistent and efficient enemy. Its strange, irregular form and ferocious habits have given it, in some localities, the name of the "Cut-worm's dragon." "When not glutted with food, it is running about incessantly in search of these worms, and slays them without mercy, with its powerful jaws seizing them commonly by the throat, and regardless of their violent writhings and contortions, sucking out the contents of their skins" (Fitch). Figure 26 represents the larva of a *Harpalus* — possibly of this species — in the act of devouring a curculio grub. Others of the *Carabidæ* feed largely upon them. Professor Forbes has found the remains of *Agrotis annexa* Treits. in the stomachs of *Pterostichus permundus* (Say), *P. Sayi* Brullé, and *P. lucublandus* (Say), and remains of undetermined species in *Chlænius erythropus* Germ., in the proportion of one-third of the entire contents (*Twelfth Report on the Insects of Illinois*, 1883, pp. 110, 111).

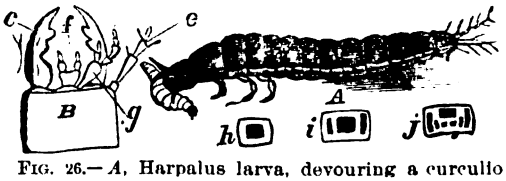


FIG. 26.—*A*, Harpalus larva, devouring a curculio larva. *B*, head seen from beneath, showing at *c*, the upper jaw (*mandible*); at *g*, the lower jaw (*maxilla*); with its four-jointed feelers (*palpi*); at *f*, the lower lip (*labium*), with its two-jointed feelers (*palpi*); and at *e*, the *antenna*; *h*, *i*, *j*, marks on the abdominal segments beneath. (After Walsh.)

An undetermined species of insect — "somewhat resembling the black wasp, but longer, shaped somewhat more like the hornet but of a shining black," has been observed eagerly searching for the worms, even digging for them in the soil with its front legs, and drawing them forth, and stinging them fatally. Leaving them to die, it would subsequently return and excavate a hole in the ground in which to bury them, and heaping a mound over them (*Albany Cultivator*, vol. v, p. 18).

Podisus spinosus (Dallas).—This carnivorous Hemipter, known from its belligerent propensities as the "spined soldier-bug," will fearlessly attack young cut-worms much exceeding it in size, and take their lives by sucking their juices through its formidable proboscis: shown in enlargement in Figure 27.

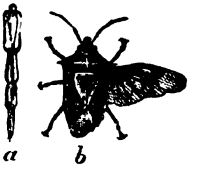


FIG. 27.—PODISUS SPINOSUS (Dallas). *a*, the beak or proboscis enlarged; *b*, the insect, with one wing extended.

Uropoda Americana Riley.—Prof. French has observed this mite preying upon the Variegated cut-worm, while tightly fastened to it by means of a peculiar stiff, elastic pedicel or cord proceeding from the anal portion of its body, which Dugés has thought to consist of the viscous and dried excrements of the animal (*7th Rept. Ins. Illinois*, p. 218, and *Murray's Economic Entomology*, p. 163).

Spiders are also known to attack and kill cut-worms in their immature stages of growth.

The Toad.—Mr. Wm. Brodie, of Ontario, regards the toad as deserving of protection and introduction into gardens from its habit of coming abroad at night and devouring the cut-worms which are then seeking their food upon or near the ground.

Mr. E. W. Allis, of Adrian, Mich., reports his having taken on June twelfth thirty-three cut-worms from the stomach of a wart-toad, *Bufo Americanus* (*Thirteenth Report State Horticultural Society of Michigan*, 1883, p. 16).

PARASITES.

The partial immunity of cut-worms from destruction by such of their natural enemies as are above mentioned, resulting from the concealment in which the larger part of their lives are passed, attends them also in preserving them, to a great extent, from the attack of those parasitic foes which serve so important a purpose in diminishing the numbers of our insect pests. Yet, as the white grub, *Lachnosterna fusca*, is pursued and discovered in its subterranean burrows by its enemy, *Tiphia inornata*, and as *Tremex columba* falls a victim to the Thalessas, although deeply buried within the trunk of maple, oak or elm, so, also, are these nocturnal marauders of our gardens and fields compelled to succumb before the fatal thrust of the ovipositor of their commissioned parasitic foes.

As few, however, of the cut-worms have been studied during their larval stage, we know, as yet, almost nothing of the extent to which they are parasitized, or the names of the species that prey upon them. One of the species, *Nephelodes violans* Guen., studied recently in connection with its appearance in remarkable numbers in St. Lawrence county, N. Y., was found to be very subject to parasitic attack. Larvæ that I attempted to rear gave me many Tachinid puparia and two different hymenopterous pupæ (1*st Rept. Ins. N. Y.*, 1882, p. 109). Prof. Riley states of the same larvæ: "Of nineteen specimens placed in a vivarium * * * several proved to have been parasitized; one had nineteen *Tachina* eggs upon it [after the manner shown in Figure 28]; another gave forth *Microgaster* larvæ, which had spun their white cocoons in a surface cavity in the ground made by the larva, and still another gave an *Ophion* cocoon" (*ib.*, p. 103). Of other species, Mr. William Saunders has written as follows: "cut-worms have been very abundant in the neighborhood of London during the spring [of 1880]. * * * When I reared a number of the larvæ with a view of breeding the moths, I found them so affected with parasites that I did not get a single moth, so that, although the larvæ were exceedingly abundant, the moths proceeding from them were comparatively rare, and all through the agency of the parasites" (*Ontario Agricultural Commission Report*, 1881, p. 219).

FIG. 28.—NEMORÆA LEUCANIÆ; the larva, fly, and puparium; also, its eggs placed upon the forepart of an army-worm, on which it is parasitic.

The following parasites are reported by Professor Riley as having been obtained by him: *Paniscus geminatus* Say—a large, yellowish-brown Ichneumon fly—its source not stated; *Nemorœa leucaniæ*, Kirkp., shown in Figure 28, from *Laphygma frugiperda* (Sm,-Abb.); and *Tachina archippivora* Riley, from an unknown cut-worm resembling that of *Agrotis subgothica* (Haworth).

Another *Tachina* fly was bred from the Black-lined Cut-worm, *Agrotis fennica* Tausch., during its recent abundance in Northern Michigan (in the months of April and May, 1884), and has been named and described by Dr. Williston as *Scopolia sequax* (Cook's *Notes on Injurious Insects — Entomolog. Laboratory, Mich. Agricul. Coll.*, 1884, pp. 5–6, figs. 5, 6).

Mr. Jno. G. Jack, of Chateaugay, Quebec, has reared from a dead cut-worm (species unnamed) a large number of minute Hymenopterous parasites, belonging to the *Chalcididæ*, which he has identified as *Copidosoma truncatellum* Dalman, a figure of which is given in the Report of the Commissioner of Agriculture for 1883 (Report of the Entomologist), pl. xi, figure 6 (*Canadian Entomologist*, xviii, 1886, p. 23).

Another chalcid parasite, *Copidosoma celænæ*, has been described by Mr. L. O. Howard (*Bull. No. 5, Bureau of Entomology — U. S. Dept. Agriculture*, 1885, p. 11), as having been reared, in the female only, in large numbers, from *Mamestra renigera* Steph., collected as St. Louis, Mo.

PREVENTIVES AND REMEDIES.

Quite a large proportion of the voluminous literature of cut-worms to which we have referred, as distributed throughout our agricultural journals, consists of methods of prevention and remedy, almost every one of which we are asked to accept as effectual, and very many of them as "superior to all others." And still the cut-worm remains with us and obstinately refuses to be exterminated.

It is not the purpose of this paper to present a compilation of what has been written upon the subject, but rather to give an abstract of what is known upon it. Nothing, therefore, would be gained by referring to the many remedial measures proposed which have not stood the test of experiment, or to those which do not give promise of accomplishing the desired results inexpensively and with that amount of labor which can easily be spared from the other pressing duties of the opening agricultural year.

The following are some of the methods that we deem the most valuable:

Salt.— A correspondent of the *Country Gentleman* [E. H.], from Chester, Pa., gives the following method of protection by the use of salt, which, after having tested its efficacy for several years, he pronounces "cheap, of easy application, and *perfectly sure:*"

"Immediately after the corn is planted, sprinkle on the hill over the covered grains, about one tablespoonful of common salt to each hill."

The explanation given for the protection of the plants is, that the salt as dissolved by the rain, dew or other atmospheric moisture, is carried down to the roots and taken up by them into the circulation; and that although salt in itself will not injure cut-worms even

if they be buried in it, they will not eat young corn if there is a little salt in its sap.

Should the salt not be applied until after the corn has shown itself above the ground, it might kill the plants: applied as above directed, it will do no harm. (*Country Gentlemen*, for Feb. 27, 1873, p. 132, c. 2–3.)

Another method of protection with salt is said to be, to soak the seed corn in a strong brine for twenty-four hours before planting. It is asserted that it prevents it from being eaten in the ground, and hastens its germination by from one to two days. This may prove to be quite as effectual in protecting from cut-worm as the application of salt upon the ground.

A writer in the *Rural New Yorker* (Feb. 18, 1888, xlvii, p. 108) prevented injuries to corn, in a field which upon plowing he found "alive with half-grown cut-worms," by sowing broadcast over the field, the day after its planting, 250 pounds of salt to the acre. Not a single hill was cut by the worms.

Copperas.—The publication of the first of the above methods called out the following, which the writer thinks "is more easily applied and equally effective," as it had been employed by himself and others for twelve years, and always with success, even upon new ground and clover land. It had been tested by planting portions of fields without the preparation, and these portions, in several instances, required replanting two or three times:

"Put the seed corn in a tight tub or barrel, and pour in enough water to keep it well covered after it swells. For each bushel of corn add a pound or a pound and a half of copperas dissolved in warm water. Stir well, and allow the corn to remain in the copperas water twenty-four or thirty hours. Stir several times while soaking. Then take out and sprinkle a small quantity of land-plaster over — enough to prevent the grain from sticking together — and plant. When prepared as directed, if a change should occur in the weather to prevent planting, the corn may be spread out upon a floor and allowed to remain until good planting weather. It will turn black in drying, but that does not matter" (*Country Gentleman*, for March 20, 1873, xxxviii, p. 179, c. 2–3).

Saltpeter.— A saltpeter solution has been recommended for pouring about the roots of plants infested with cut-worms. It is said to kill the pests while at the same time it operates as a nitrogenous fertilizer, aiding the plants to resist attack.

Hellebore.—An experiment with hellebore dissolved in water has proved entirely successful in protecting young tobacco plants from the worms. A writer from West Meriden, Conn., gives this satisfactory account of its use:

"On Tuesday, June 22d, we set three thousand plants, and on the next morning I took from one row of one hundred and eighty plants, two hundred and fourteen cut-worms, and on the same day, in the same field, I set twelve plants dipped in a solution of white hellebore, and to this time they remain untouched, while the plants in the rows on either side are more than half destroyed. June 24th *we set over two thousand plants treated in the same manner, and I find only one plant eaten, and that slightly.* The plants are not injuriously affected by the treatment. On plants already set, sift the powder from a muslin bag, and I am told they are protected perfectly. It appears to be a specific for the cut-worm. We use one-quarter of a pound to ten quarts of water" (*Count. Gent.*, for July 8, 1875, p. 425).

Coal Oil.—Not only is the odor of this substance serviceable in preventing attack, but the oil is also an insecticide. It could be mixed with dry sand and scattered around the plants to be protected, as for example, a tablespoonful about a cabbage or tomato plant. To check the depredations beneath the surface or to destroy the larva hiding there, it might be necessary to use it in a larger quantity. A teacupful of the oil (kerosene) to a pailful of sand has been recommended, to be renewed each week during the presence of the worms. A larger proportion of the oil might safely be used—a sufficient quantity to moisten the sand to a degree not preventing its running readily through the hand when distributing it.

Cultivation of sod-land.—It is claimed that where land is not allowed to lie in sod for over two years at a time, cut-worms will not accumulate in it, and consequently corn planted upon it when broken up suffers much less from attack.

Thick planting.—Planting more seed than is needed for maturity has frequently been found of service. When the larvæ are not numerous, two or three stalks of corn or beans may suffice them to complete their growth when near their pupation and the attack is late. Although the labor of subsequently thinning by hand is saved, the policy can not be recommended, as the relief obtained is but temporary, for the numerous progeny of the larvæ which you have helped to mature, may the following season require for their needs every stalk in a hill.

Late plowing.— A gentleman from Chautauqua county, N. Y., states, from the result of forty years experience, that plowing the ground late in the autumn or in the winter, if there is hard freezing afterward, will certainly destroy the cut-worms (*Count. Gent.*, for Feb. 29, 1874, p. 71).

The efficacy of such late plowing has been affirmed by many writers, and has also been presented in some of our entomological reports as one of the best of remedies. That it has not always been attended with success (see *C.-G.*, for March 5, 1874, p. 147, where the method is said to have failed entirely), may be accounted for by its not having been done at the proper time.

The plowing should be deferred until the cut-worms have become torpid, and it should be sufficiently thorough to crush the cells that they have shaped for their winter's sleep. These cells are believed to be essential to their survival of the winter. Within them, curled in a ring, and in such a position that the smallest possible portion of their surface (a single point only upon a few, not all, of their rounded segments) is in contact with the ground — they undergo freezing, perhaps alternate freezing and thawing over and over repeatedly, with impunity.

Under different conditions — with the soil enveloping them, resting upon and adhering to their entire surface, covering their breathing-pores and working within the joints of their abdomen — it would indeed be a marvel if the rigors of winter should not prove fatal to them. The entomologist knows how important it is that the cell shaped by the caterpillar for its pupation, in carefully prepared ground, for its three or four weeks occupancy in the summer, should not be destroyed if he would succeed in obtaining the moth for his cabinet.

Late plowing in the spring, just before a late planting, has also been recommended for infested sod-land, upon the theory that the cut-worms will have fed to maturity upon the sod, leaving the corn to spring up untouched, and with a more vigorous and healthful growth in the warmer soil and temperature of the advanced season.

Tin Bands.— A simple, cheap and permanent device is this: A strip of tin two inches wide, ten inches long, bent into the form of a cylinder, with a narrow lap at each end so as to hook together. The following is given in its favor:

"It works to a charm; no cut-worm ever goes over it; it can be hooked together and put over a plant, and remain there until the

plant is out of the way of the worm, then it can be unhooked and put away for another season. The inside should be painted, as the bright tin when new will concentrate the rays of the sun and burn the plant. They cost about $1.50 per 100, and will last a long time, if painted" (*Country Gentleman*, for May 31, 1877, p. 348, c. 1).

Paper Frames.— A writer gives this method for protecting from cut-worms in a garden or patch: "Prepare at leisure a quantity of small paper boxes — say from four to six inches square, without bottom or top, made to taper about half an inch. Place these around the plants, the widest part up, so that the worms can not crawl up their sides. Dipping the boxes in a strong solution of shellac will, with care, make them last for years."

Paper Wraps.— The bands and frames above mentioned can only give protection against those larvæ that feed above ground. A simple device, involving no expense and hardly any labor, often employed by gardeners to protect cabbage and tomato plants from the species that sever the stalks below the surface, is that of wrapping a piece of rather thick paper around the stalk as the plants are set in the ground. Allowing it to project a little distance above the ground may also circumvent the surface feeders. A burdock leaf, or some other leaf of sufficient size, is sometimes used instead of the paper.

Clover Traps.— Mr. T. Boynton, of Michigan, states that he has been very successful in entrapping cut-worms by placing wads of clover among his tomato plants. The worms would gather about them during the night, eat what they wanted, and secrete themselves in the earth close by, not over six feet distant. As many as eighty-two worms were found in the neighborhood of one of these balls of hay [made of about the size of an apple]; in another instance, seventy; in another, sixty-eight. On June fourth he claims to have destroyed over 15,000 of these worms, which were on and about his clover balls, by using boiling water. When the worms chance to be even slightly protected, nothing less than water boiling hot will kill them (*Country Gentlemen* for June 27, 1872, p. 409, c. 1).

An improvement upon this method has been recommended by Prof. Riley, the publication of which is made as these pages are to be handed to the printer (*Ann. Rept. Depart. Agricul.*, for 1884, pp. 299, 300). It is the poisoning of the bait to save the labor of collecting and killing the larvæ by the hot water, or otherwise.

Prof. Riley states: "We used chiefly clover sprinkled with Paris-green water and laid at intervals between the rows, in loosely-tied masses or balls, which served the double purpose of prolonging the freshness of the bait and of affording a lure for shelter." A modification of the method, employed by Dr. Oemler, of Savannah, Ga., was that of preparing cabbage or turnip leaves by dipping them in a well-stirred mixture of a tablespoonful of Paris green to a bucket of water, or sprinkling the side next the ground after first moistening with a mixture of one part of Paris green to twenty of flour, and placing them at distances of from fifteen to twenty feet throughout the field to be protected. Two applications of this character at intervals of three or four days, particularly in cloudy weather, were usually successful in ridding the field of the pest.

Trapping in holes.—An old method which is occasionally noticed as attended with good results, is that of making several holes a few inches deep about the hills, with a tapering stick to compress the earth at the sides, into which the worms would fall and be unable to crawl out. It is stated that in some instances where this has been resorted to, some of the holes were found to have been half-filled with cut-worms during a single night. They could be killed by reinserting the stick, or left to die, or to devour one another as some of the species are known to do when the opportunity offers in the absence of other food.

Digging out.— The recommendations of digging out and destroying the cut-worms when the plants are seen to be cut off by them, doubtless seems a poor remedy to those who have never tested it—as requiring too much valuable time and labor, and therefore, not available when large fields are to be protected. Its rejection or even its non-acceptance should not rest upon a mere prejudice against it, for if proven to be both practicable and effectual, it can not fail of being one of the best, if not *the best* of methods of dealing with this pest, for this simple reason: Many other methods merely prevent the feeding upon the protected crop, but leave the hungry creatures free, with appetites sharpened by delay, to attack and destroy other and often more valuable crops. With a cut-worm dug out from its retreat beside a wilted plant, and killed, there is this satisfaction, not only that its career for further harm is ended, but that it will not develop into a moth containing within its abdomen two hundred or more eggs, each of which would later produce a cut-worm.

Is the digging-out method practicable on a large scale, and will it give the results desired? An "Old Farmer" writes as follows of it, after premising that he had made a faithful trial of many remedies, but was now employing this in his corn-field, and that it was adopted, so far as he knew, by all good farmers.

"I have six acres of corn planted on sod which was turned over from a pasture just before planting. By the time it was up, the cut-worms made their appearance by hundreds, and my hired man was alarmed. 'All right,' said I, 'I am ready for them.' I set my two men at work on them, making regular days work of the business. Taking a row at a time, and digging down wherever a corn-plant was cut off, they went over the field in about half a day, killing over fifteen hundred. A few days later, they went over again, and did not get quite so many. I had the corn planted rather thick, and the plants which the worms took could be spared. At the third hunt, when the corn was about as large as the worms could manage, I directed the crop to be regularly and evenly thinned, at the same operation. I have saved my corn, and have a handsome and even field. Had I let the worms have their way, I should certainly have lost half. I once lost over three-fourths. I have spent three days work in this way, worth $4 — and I have saved by the operation at least one hundred bushels of corn on the six acres; more probably one hundred and fifty. *I think it pays!*" (*Country Gentleman* for June 14, 1877, p. 376.)

The letter states that the cut-worms destroyed, were "the plump brown grub that cuts the corn off just below the surface."

Another species of cut-worm differs in its habit of feeding from the above, in that it cuts the corn off just *above* the surface of the ground. It is this species which is referred to by Mr. Armstrong, secretary of the Elmira Farmers' Club, in his commendation of the digging-out remedy. He writes:

"There is really but one way to save the crop after the plants are once attacked by cut-worms — that is, to dig the worms out and kill them. It is not a difficult task, nor is it very costly. I presume that a fourth part of the loss sustained, would be a full equivalent of all the labor it would cost. The worm does the mischief at night, and before morning burrows in the ground near the spot where its depredations have been committed. A practiced eye will readily discern the entrance to the hiding-place into which the

worm has passed and lies concealed. The way to bring the pest up is to thrust a pointed knife down near the hole and lift out the earth to the depth of two or three inches, when the malefactor will lie exposed to view, and can be instantly destroyed. I have known large fields to be cleared by this process at a cost of labor so slight as to bear no comparison with the loss that would have otherwise resulted" (*Country Gentleman* for Jan. 6, 1881, p. 8).

The idea has been advanced that dandelions (*Taraxacum dens-leonis*) foster the cut-worm, and if these were carefully cut up whenever seen, its injuries would be greatly mitigated (*Country Gentleman*, June 20, 1872, p. 392, c. 2). Examinations about the plants during the month of June, would show if there is reason for this belief.

Starvation. — An instance is related where cut-worm attack was forestalled by removing their food-material from the ground. A piece of sod was turned over before the grass had made much growth. It was dragged, to bring up the roots and dry them. A week later, another dragging was given it, which destroyed every green thing. It was then planted with corn, and entirely escaped the usual cut-worm attack (*Country Gentleman*, May 6, 1875, p. 277, c. 1).

This method can not fail of being as effectual against cut-worms as for destroying the white grub, for which, in a former paper, I have strongly recommended it. [See page 31 of the present volume.]

TWO PREVENTIVES SPECIALLY COMMENDED.

It will be observed that quite a number of preventives and remedies have been given above, and it may be asked why this is so frequently done in our entomological writings. We reply: A method adapted to the soil of one locality may not be as effectual in another; it may be more difficult of application in one place than in another; it may be available for garden use, but not for the more extended area of field and farm; it may require to be thoroughly tested before its real merit is known and it can be urged to the exclusion of others.

It would seem, however, that we have in the above, two preventives for cut-worm attack in corn fields, either of which may be relied upon for general use. We speak thus strongly in their favor, in consideration of the tests made of their efficacy, as in the state-

ments subjoined. Of the protection by salt, Mr. J. L. du Fief, of Montgomery county, Maryland, writes as follows:

"I tried the salt by selecting a piece of ground occupied for three years by a straw-rick, and upon which my cattle ran. After removing the old straw and manure and top-dressing the adjoining field, I selected this spot, as I had always found worms worse in such places. Immediately after planting the corn, I applied one table-spoonful of salt scattered over the hill. *Not a hill was touched by cut-worms, but all around this plot, where salt was not applied the worms cut two to three out of five hills*, and we often found one to fifteen cut-worms in a hill, but none where salt was applied."

Mr. du Fief also bears testimony to the value of the copperas preventive. He gives his manner of preparing the seed-corn, which differs slightly from that stated above mainly in time of soaking.

"I pulverized two pounds of copperas at night, and the next morning put in soak, and I put one and a half bushels of corn in soak in a separate vessel at night. After soaking twelve hours, I poured off the water from the corn into a tub; I then added as much water as will cover the corn, and add to it the copperas water, and thoroughly mix and pour over the corn, and let it remain in copperas water twelve hours; I then poured off the copperas water and rolled the seed-corn in J. J. T——'s Excelsior, or plaster."

Condensing his details — a forty-four acre field was planted in corn — first ten acres without the copperas preparation — next to it nearly ten acres with the prepared seed, and the remainder with unprepared — all treated alike, except the copperas application. He writes:

"To the surprise and satisfaction of myself and hands it [the prepared corn] came up regular, green and vigorous, and grew rapidly. I soon found it necessary to replant. I found, on examination, *not a hill cut or a worm to be found where the copperas was used*, and the entire field elsewhere cut from two or three hills out of five, with, sometimes, fifteen cut-worms in a hill."

The results, as obtained by his neighbors, as well as by himself, were pronounced most marked and astonishing (*Country Gentleman*, for April 23, 1874, p, 259, c. 3).

Mr. E. Harvey, of Chester county, Pennsylvania, confirms the efficacy of the salt application, as above directed (not applied to the blades of corn, which it will kill), based upon the results of a great

many trials made by a great many different persons during the last fifteen or more years (*Country Gentleman*, for July 2, 1874, p. 419, c. 4).

IN CONCLUSION:

If, gentlemen of the Society, I have occupied too much of your time in the consideration of these details, my excuse must be, the importance of the subject discussed, and my desire, whenever I have the privilege of addressing you, of presenting my subject in a manner worthy of your acceptance, and that you may be given, as near as may be, all that it is desirable for practical purposes, to be known upon it.

The Aphididæ, or Plant-Lice.

By J. A. LINTNER, Ph. D.

Written for the Annual Meeting of the New York State Agricultural Society, January 19, 1887.

I propose to speak to you this evening of a class of creatures which are so inconspicuous, so plain, and so simple in their habits, that, if they might with any propriety be taken as the type of the insect world, our larger lexicons would not be greatly at fault when they offer as one of the definitions of an insect, "anything small and contemptible." Yet, despite their apparent insignificance, their operations are ofttimes as potent and as fatal as are the malarial germs, which, unseen, invade the human system, gradually sapping its vitality, inducing disease, and destroying life.

In addition to the general unattractiveness of the members of the family of *Aphididæ*, they have also been unfortunate in the popular name which has been given them. The name of "plant-lice," which they incorrectly bear, carries with it a certain degree of the opprobrium that attaches to these creatures which live as parasites on the animal kingdom — on mammals mainly, and are so associated in our minds with unclean habits and degradation or disease. Lice, properly speaking, are the small insects of simple organization which are parasitic pests of men and animals, and from their structural peculiarities have been, by our best systematists, arranged in a group known as *Parasita*, forming one of three sub-orders of Hemiptera. The resemblance of the plant-lice to them lies chiefly in the general appearance of the wingless forms and in their method of feeding through a proboscis.

Systematic Position of the Aphididæ.

The family of *Aphididæ* belongs to the order of Hemiptera (which embraces those insects which may properly be designated in popular parlance as bugs), and to the sub-order of Homoptera. In this sub-order it is arranged in the division of *Dimera*, which contains, as the name imports, those plant-lice which have two

joints in their feet. Allied to it, on the one hand are the *Psyllidæ*, or the jumping plant-lice, and on the other hand the *Coccidæ*, or bark-lice, both of which are sometimes included with the plant-lice, but from the different features which they present it would seem that they should properly be excluded.

FEATURES OF THE APHIDIDÆ.

The *Aphididæ*, or plant-lice proper, may be briefly described as small, oval or ovoid insects, ranging in size from about the one-twentieth to one-fourth of an inch in length, of green or brown or black colors, with a soft, tender, yielding body, joined often obscurely to the thorax, and with a distinct head, bearing well-marked and prominent eyes, and antennæ having from three to seven joints, and varying in length from little exceeding that of the head to twice the length of the body. A beak or proboscis arises from the back part of the head beneath, which, when not buried in the plant for sucking the sap, is usually pressed up against the breast. From one of the hinder segments of the abdomen, two short cylindrical or subcylindrical tubes are to be seen in many of the species, on the upper side of the back, which are commonly known as honey-tubes, from the purpose which they serve of discharging, often quite abundantly, a sweet liquid substance called "honey-dew." The legs are long, and show the usual principal divisions. The wings, when present, are four in number, transparent, with but few veins, and the front pair much the larger; they are often carried perpendicularly over the back, folded together. A more minute description would seem unnecessary in this connection, when we cite as good representatives of the family the apple-tree aphis and the woolly apple-tree bark-louse [shown in Figures 1 and 2].

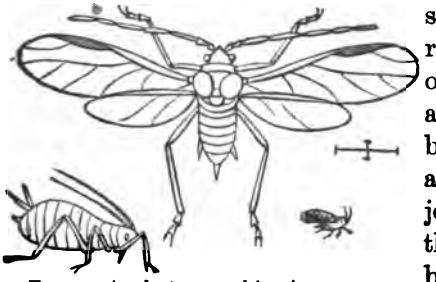


FIG. 1.—Apple-tree aphis, APHIS MALI, winged and wingless forms.

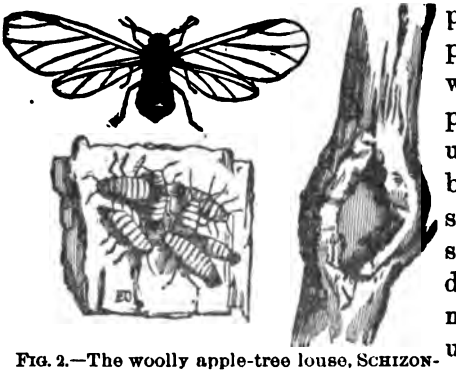


FIG. 2.—The woolly apple-tree louse, SCHIZONEURA LANIGERA, and infested twig.

I have been led to make these insects the topic of a paper, in consideration of their general dissemination, the excessive injuries resulting from the multiplication of some of the species, the exceedingly interesting method of their propagation, and the important additions that have been made to our knowledge of their life-histories within the past few years. These several points may only be cursorily referred to in the time that I dare claim your attention.

DISTRIBUTION OF THE APHIDIDÆ.

The observations of that distinguished naturalist of the past century, whose name—LINNÆUS—is revered wherever natural science is cultivated, led him to believe that every species of plant had its aphis belonging to it, and occurring on no other. The names, therefore, that he gave to the species which he described were almost invariably those of the plant upon which they were discovered. Thus, in his *Systema Naturæ*, we find *Aphis pini*, *Aphis quercus*, *Aphis betulæ*, *Aphis ulmi*, *Aphis rosæ*, and sixty other species of *Aphis*, *Chermes* and *Coccus*, named from the particular plants on which they were first observed.

Even so late as 1865, Dr. Fitch apparently held the opinion advanced by Linnæus of the single food-plant of the aphis, for we find this statement by him: "So nearly identical are most of them [Aphides] both in appearance and habits, that we know them to be distinct species only from the fact that they inhabit different plants, each one being unable to sustain itself upon any other than the plant to which it belongs."

Closer observation and more extended study has shown that the Aphides are not always limited to a single species of plant, but that one species may occur on several distinct plants, may even migrate from one to another and that such migration is really essential to its perpetuation; and further, that several quite different species of Aphis may subsist upon the same plant. Thus Dr. Fitch, in his first report, has written: "Every kind of tree, shrub and herb, it is probable, has a species of louse infesting it, whilst many have two, three or more, each part of the tree having its peculiar species."

Whilst every kind of plant has not been found with its infesting aphis, yet the exceptions are comparatively few. Dr. Thomas, formerly State Entomologist of Illinois, in his Eighth Illinois Report (1879), has stated that none have so far been observed to

feed upon the *Fumariaceæ* (the Fumitory family), the *Gentianaceæ* (the Gentian family), or the *Iridaceæ* (the Iris family), and that the *Labiatæ* (the Mint family) are almost wholly exempt, as are also the ferns and other Cryptogams. This statement, however, needs correction. M. Jules Lichtenstein, in *La Flore des Aphidiens*, published in 1884, records aphids upon *Menyanthes* and *Limnanthemum* in the *Gentianaceæ*, and on *Gladiolus* in the *Iridaceæ*, leaving the family of *Fumariaceæ* standing alone, at the present, of all the families of the vegetable world, in exemption from aphis attack. So extensive a range is, we believe, without a parallel in the insect world, comprising several hundreds of divisions of coördinal value with the *Aphididæ*.

INJURIES FROM THE APHIDIDÆ.

The aggregate amount of injuries to cultivated crops and other vegetation of value or utility to man, inflicted by this family, could not be other than enormous. The number of known species is very large, and large accessions are being made to the list whenever special study is directed to them. M. Lichtenstein (*loc. cit.*) records 800 species with their food-plants. As the result of a multiplication almost incredible in its rapidity, to be hereafter referred to, the number of individuals under which a species often presents itself is simply marvelous — at times entirely covering the plant on which it occurs, even enveloping its more tender portions with two or three layers, whilst those not so fortunate as to secure a foothold, may lie banked up in a hungry, struggling mass at the base of the trunk. And then, too, feeding directly on the vital juices of the plant, the fatal drain is more quickly effective than if root or stem were excavated or foliage eaten. A plant, had it tongue, might well utter the prayer: "Let me fall in the jaws of the powerful and ravenous Mandibulata, rather than be exposed to the proboscis of the persistent Haustellata." I doubt if within the untold myriads of the animal kingdom there are any creatures which impose a heavier burden on the labors of the agriculturist and the horticulturist than is laid by these pigmy plant-lice. So general are their depredations that it would not be possible to present any approximate estimate of the aggregate of losses sustained from them.

According to Kirby and Spence, "the difference in the amount of the duty on hops in Great Britain is often as much as £200,000,

more or less, in proportion as the hop-vine aphis prevails in that country, or the contrary"—*i. e.*, the presence or absence of this pest might vary the excise duties on the amount of hops grown, two millions of dollars in a year—the duty price, to 1860, being 19*s.* 7$\frac{1}{2}$*d.* per cent.

From data given* by Mr. Charles Whitehead, in his paper on "The Hop Failure of 1882," in Great Britain, it may be computed that although the crop that year was one-fourth of an average, and prices (£20 per cwt.), in consideration of the short crop, ruled nearly three times higher than the average price for the preceding twenty years (7*l.* 7*s.* per cwt.), yet the gross value of the crop was $6,875,000 less than that of an average year. If to this be added the amount that would have been distributed for picking an average crop ($1,125,000), we have, as the aggregate loss from the *unusual* abundance of the hop-vine aphis in Great Britain in 1882, eight millions of dollars.

The attack of the grain aphis, *Siphonophora granaria*, on the wheat and oat crops in 1861—so remarkable from its severity and from its not having been previously known among us as an injurious insect—is probably within the recollection of some of those present. Throughout the New England States, the State of New York (except its western section), the north-eastern portion of Pennsylvania, and in several parts of Canada, every grain-field was invaded by it, and in most of them it abounded in incredible numbers. In some localities the yield of wheat was reduced one-half, and crops of oats were still more seriously injured and hardly

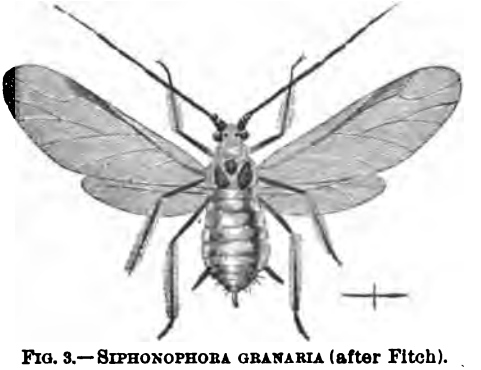


FIG. 3.—SIPHONOPHORA GRANARIA (after Fitch).

Data: Average crop of hops, 7 cwt. per acre; on 65,619 acres of hop-land in the United Kingdom in 1882, 459,333 cwt. As an average price, 7*l*, 7*s.* per cwt. for twenty years preceding 1882, would give £3,376,197. Average produce for 1882, 1$\frac{1}{4}$ cwt.; total yield, 114,832 cwt. Sold at average of £20 per cwt. Gross amount realized about £2,000,000.

Picking an average crop on above acreage, £380,000; paid for picking in 1882, £155,000.

paid for the gathering. I have no estimate of the aggregate amount of losses in our State from this attack.

For the last fifteen years, much has been heard of the Phylloxera in France—introduced there, it is said, from this country about twenty years ago, having been first detected in the French vineyards in 1863, on the roots of the vines, spreading with wonderful rapidity, creating great alarm five years later, and with its increase working such destruction in the vineyards, that in 1879 nearly two millions of acres of vines had been entirely destroyed, taken up, and the land appropriated to other uses.* The highest scientific talent of Europe has been employed in its investigation; 300,000 francs ($60,000) has been offered by the French government for the discovery of an effectual means for destroying it, and the annual appropriation made for its study and treatment reached the amount, in 1883, of 969,750 francs ($200,000). The fearful aggregate of losses sustained from this insect has called forth publications upon it that would fill many volumes, and yet it is only a plant-louse, one of the smallest, which was first detected in Washington county, New York, and described by Dr. Fitch, in the Transactions of the New York State Agricultural Society (1855) as *Pemphigus vitifoliæ*—now known as *Phylloxera vitifoliæ*, [Fig. 4 shows the female, in dorsal and ventral views, greatly enlarged—the natural size given within the circle at the left.]

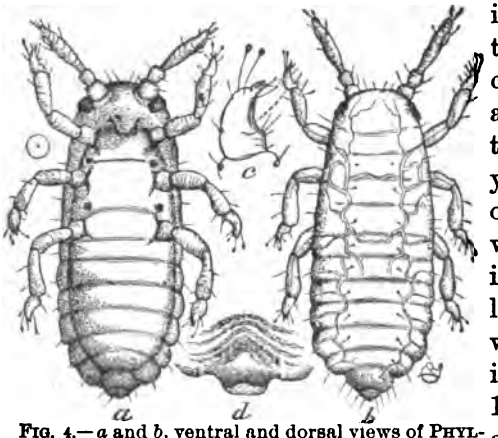


FIG. 4.—*a* and *b*, ventral and dorsal views of PHYLLOXERA VITIFOLIÆ female; *c*, enlarged tarsus; *d*, shrunken anal joints after oviposition.

PROPAGATION OF THE APHIDIDÆ.

The wide-spread distribution of the Aphides over the vegetable world—associated as they are with almost every plant that grows as if they were a natural product of it, and the excessive injuries which they have at times occasioned, will fully justify the claim

*In forty-three departments in France, 1,773,154 acres (*American Entomologist*, iii, 1880, p. 176).

that we have advanced of a special interest attached to them; yet nothing relating to these little creatures can equal the interest that pertains to their peculiar mode of propagation. No other insects are brought into the world in this same manner, nor does this same method occur elsewhere in the entire range of the animal kingdom. With them the old time-honored adage of *ab ova omnia*, would seem to be falsified.

Aphides, as a rule, hatch from eggs in the spring, that after fertilization had been laid the preceding autumn. They, the first brood, are all females — not an individual of the male sex occurring among them. They feed, cast their skins with their growth, perhaps four times, mature, and give birth to living young, all females. These maturing in some species in five days — in their turn, produce living female young. And thus, without the presence of the male sex, this peculiar propagation is continued throughout the summer and through several successive generations. In one instance as observed by Bonnett, through five generations in thirty-seven days. In another instance recorded, eleven consecutive generations have been observed in seven months. In the autumn males appear, and a different form of female. The sexes copulate, and fertilized eggs are deposited for winter hibernation, as before stated.

Nor is this mode of generation — *agamic*, as it is designated, being without a union of the sexes — necessarily limited to a portion of a single year. Kyber, in 1815, has had the rose-aphis producing young for four years. From his carefully conducted experiments and from corresponding ones made by other naturalists, a law has been educed, which we dare not deny, that "under certain circumstances, a female aphis, may, without coupling, continue *propagating to infinity*, provided that the necessary conditions for the development of young — food and heat — are not wanting."

Various explanations have been offered in the attempt to account for the singular phenomena above narrated. It has been held to be the result of hermaphrodism, but this is not sustained by anatomical investigation. Some have seen in it a parthenogenesis, quite beyond that which is occasionally observed in some of the higher insects — not infrequently in the Lepidoptera among the moths, when, as in numerous cases recorded, a female moth reared in confinement, without the possibility of association with a

male, has deposited fertilized eggs, which have produced their larvæ, and subsequently given the perfect insect; and in the queen honey-bee, the unfertilized eggs of which, produce the drones. Others regard it as illustrating the "alternation of generations" of Steenstrup, in that several generations produced as living young, are succeeded by another generation proceeding from eggs.

M. Lichtenstein, who has studied the plant-lice closely, and published extensively upon them, and is distinguished for his studies of the Phylloxera, has accepted the view taken by von Gleichen, in 1770, that this mode of propagation is to be regarded as a kind of gemmation or budding, such as we find in some plants, in polyps, jelly-fishes, etc. The aphides which produce living young, by gemmation, he regards as false females, and, in his special nomenclature, are designated as *larvæ*. One of the later forms of these, which becomes winged and seeks some other plant on which to continue the species, he calls *emigrants*. The brood that produces the sexed individuals (also false females) are to him, *pupæ*. By budding or gemmation these bring forth the sexual forms, males and true females at the end of the season.

The natural history of the *Aphididæ* as a family, can not be given. They differ so greatly in the subfamilies in which they have been grouped, and even in the smaller groups, as to present very little in common. Accurate and satisfactory life-histories, must necessarily be confined to species. Further, as a family, they have been imperfectly studied. From its exceeding economic importance, the grape phylloxera has received careful and elaborate study, extending over a series of years, and bringing to its aid the best appliances of modern science—the highest scientific ability of Europe, united with the very valuable investigations of Professor Riley, in this country. As the result, its entire life-history, complicated and difficult as it is under the many forms assumed by it, and some of them hidden almost beyond the hope of detection, has finally been worked out. I would not attempt to give it to you without the aid of proper diagrams. Suffice it, at the present, to say, that the insect, in the process of its development, has been figured and described under twenty-five different forms, of which no less than six are eggs of different kinds.

I may remark in passing, that the species of Phylloxera, which is a generic appellation, although ordinarily used as referring to the grape species alone, or to the diseased condition of the vine which it produces, are numerous. Besides occurring on the grape, they are found on hickories (in fifteen species), on oaks (several species), and on chestnut. The study of one by no means indicates the history of another. [In figure 5, one of the species which infests the bitternut hickory is shown, *Phylloxera caryæcaulis* Fitch.]

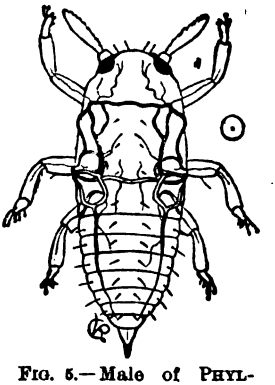


FIG. 5.—Male of PHYLLOXERA CARYÆCAULIS—the dot in the circle showing the natural size.

In another subfamily of the *Aphididæ*, are grouped the *Pemphiginæ*, among which are plant-lice that form galls on the leaves of poplars, elms, etc., within which their colonies are produced; and others which infest the trunks and branches of trees, covered individually with a cottony secretion, and therefore known as "woolly plant-lice." Thanks to the labors of Professor Riley, we have been given careful and entire life-histories of some of these interesting forms. May I briefly give you, in illustration, the history of one of them—that of *Schizoneura Americana* Riley, the American elm-leaf aphis.

The egg may be found in the crevices of the bark of the white elm (*Ulmus Americana*) during the winter, more or less covered with the dried skin of the parent. The individual that hatches from the egg is known, translating a name given it by a German writer, as the stem-mother. By puncturing and irritating the lower surface of a leaf where place has been selected, she causes the growth of a gall which gradually envelopes her (with the exception of a small opening for exit). She increases in size, molts three times, matures in about twelve days, and commences to bring forth her young at the rate of one every six hours, until she is surrounded by a large colony of offspring.

These, the *second generation*, are similar to their mother, but do not attain her size. A portion of them leave the gall and found other colonies.

The *third generation* show marked differences from their progenitors, and all become winged. They are short-lived, dying soon after they have brought forth a dozen or more pseudova—

young enveloped in an egg-like pellicle, which is ruptured and cast aside a few minutes after birth — and the *fourth generation* is developed.

These scatter over the trees and feed on the juices of the tender leaves. They are partly enveloped in a white, cottony secretion. On reaching maturity they reproduce rapidly, and their numerous progeny soon overrun the tree, and may be seen in the month of June infesting every leaf and crowding on the trunk.

The *fifth generation* is quite similar to the fourth, and like it, reproduces without acquiring wings.

The *sixth generation* abounds in July, and all acquire wings— the second winged generation. Their young are enveloped in a pellicle like those of the fourth generation, and are consigned to the crevices of the bark.

In the *seventh* and *final generation* sexual individuals are produced. Quite sluggish in their movements, they congregate in patches on the bark, where they feed. They molt, change in appearance, lose their proboscis or sucking beak, and present characters which permit of a ready recognition of the sexes. The female is larger than the male, more pyriform in shape, and shows through her transparent skin a single egg, which may be watched as it increases in size, until it nearly fills the entire body. After some days of quiet life passed together, they both die, with the egg remaining within the shriveled skin of the female. The egg hibernates and may be found during the winter under the conditions before stated.*

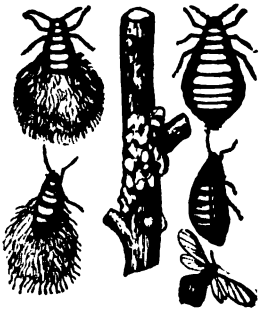


FIG. 6.—The woolly louse of the apple, SCHIZONEURA LANIGERA.

FIG. 7.—The apple-root plant louse, SCHIZONEURA LANIGERA; *a*, the knotted root; *b* and *c*, wingless and winged larval forms.

* Bulletin of the U. S. Geolog.-Geograph. Survey of the Territories, v., 1879, pp. 4-7.

The woolly-aphis of the apple, *Schizoneura lanigera* (Hausm.), is another noted member of the *Pemphiginæ*, and of more than ordinary interest from the two distinct forms under which it occurs — the one on the trunk and branches (Fig. 6) and the other on the roots. (Fig. 7.) The latter was described by Dr. Fitch as *Pemphigus pyri*, under the belief that it was an entirely distinct species from the long-known European form, *Aphis lanigera* Hausm., and belonged to a different genus. The absolute identity of the two species has only been established after much discussion and no little controversy, and even yet some particulars relating to its history are unsolved and in dispute. (See Dr. Thomas' article of ten pages upon it, in the *Eighth Report on the Insects of Illinois.*)

IMPERFECT KNOWLEDGE OF THE APHIDINÆ.

It would, undoubtedly, be of greater interest and of more value to you could I relate the life-histories of our more common Aphides belonging to the subfamily of *Aphidinæ*, in which we have the apple-tree aphis, the cherry-tree aphis, the plum-tree aphis, the peach-tree aphis, the grain-aphis, the hop-vine aphis, and other common and destructive species. Unfortunately, this extensive and important group has failed to receive the attention that it justly merits. Much relating to the above-named species is still unknown. I will mention a few of the points where additional observation and study are needed.

Sudden disappearances of the apple-tree aphis, *Aphis mali* (Fabr.), in midsummer, from trees that had been overrun with them, have been occasionally reported by reliable observers. Can such an occurrence be chargeable to an extraordinary and sudden increase in the number of the parasitic and other enemies of the plant-lice, or to peculiar and unknown meteorological conditions — reasons that have been assigned for this phenomenon? Or shall we find, on careful observation, a summer migration of the aphis to some other food-plant, confirmatory of the statement of such a habit observed by a European writer? If it migrates, what tree or plant does it select for its new food, and why the necessity of a migration, since it would be compelled to return to the apple-tree in the autumn for the deposit of its eggs, which we find so abundantly thereon, and the insects busily engaged in placing them in the crevices of the bark during the month of October? The well-known black aphis of our cherry-trees, *Myzus cerasi* (Fabr.), of

which Dr. Fitch made the interesting computation that on a single small tree only ten feet in height there were twelve millions of individuals, was believed by Dr. Fitch to occur only on the garden red cherry, *Prunus cerasus*. The same aphis has since been found on plum-trees; and a form observed during the past ten years infesting very injuriously the roots of young peach-trees on the Atlantic seaboard in Maryland and Pennsylvania, has been referred to this same species, *Myzus cerasi*, although doubt is entertained if it be different from the root-inhabiting form of the peach-tree aphis, *Myzus persicæ*.

The winter existence of the grain-aphis, *Siphonophora granaria* [shown in figure 8], is an enigma to us, differing greatly, as it seems to do, in its habits from most of its allies.

FIG. 8.— Wingless female of the grain-aphis, SIPHONOPHORA GRANARIA (after Fitch).

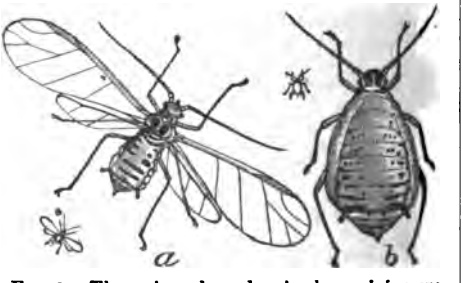


FIG. 9.—The winged and wingless viviparous females of the cabbage-aphis, APHIS BRASSICÆ.

It is asserted that of the exceedingly common and wide-spread (in Europe and America) cabbage aphis, *Aphis brassicæ* (Linn.), the male has not been discovered. [Figure 9 *a*, is the winged form mistaken by Curtis for the male.] If this be true does it furnish an illustration of propagation continued indefinitely through gemmation, to which reference has been made, or are the two sexual forms yet to be discovered in company on some other food-plant than the cabbage?

RECENT DISCOVERIES.

The most interesting addition that has been made in recent years to our knowledge of the habits of the Aphides is that of their migration. For most that we know of this mysterious habit in these strange insects we are indebted to M. Lichtenstein, whose extended and successful studies of this family have made it necessary for me to refer to him several times in this paper. He has

shown us that many of our Aphides, especially the *Pemphiginæ* have a midsummer migration of the winged agamic female—given wings apparently for this sole purpose—from one plant to another, as from the hop-vine to the plum; and, in some tree-inhabiting species, thence to the roots of grasses and herbaceous plants. Of course, there is a return migration later in the year of the descendants of these migrants, that the species may be continued on the original food-plant. In illustration of the above, the principal phases of the life-history of an European elm-feeding species, *Tetraneura ulmi*, may be given in a few words.

The eggs, deposited in the crevices of the elm bark, hatch early in May, giving the stem-mothers or founders of the broods, which produce galls in the leaves and therein bring forth their young. These acquire wings and fly away to the roots of corn, where their wingless descendants may be found feeding in October. From these again a generation is produced which acquire wings, by the aid of which they transport themselves to the feeding ground of their vernal progenitor, several generations back—the elm. Sexual forms are brought forth by these, which copulate, and eggs are deposited in the crevices of the bark, to be hatched the following spring.* In addition to corn, the *T. ulmi* also migrates to the roots of a grass, *Cynodon dactylon*.†

Kessler, another faithful student of the Aphides, has observed several species, eight of which are named, to leave the trees in the month of June and return to them in October, but he was unable to discover where they went and their place of sojourn meanwhile. Among these which he names are four species which occur, also, in the United States, viz.: *Aphis viburni*, *A. sambuci*, *A. pyri*, and *A. mali*—the last our common apple-tree Aphis.

A migration of the corn-aphis, *Aphis maidis* (Fitch), in its winged oviparous form, coming up from the roots of the corn, has recently been observed (in 1885) by Mr. H. Garman, assistant to the State Entomologist of Illinois, Professor Forbes, as occurring in the last week of July. The migrants, surrounded by their young, were subsequently found (in the latter part of August) feeding on young grasses of the genus *Panicum*.‡

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* *Entomologist's Monthly Magazine*, xx, 1884, p. 62-3.

† *Id.*, p. 179.

‡ *Entomologica Americana*, ii, 1887, pp. 175-177.

If these migrations were only from leaves and bark and stem to the tender rootlets of the same plant, when the former had become too matured to offer longer the needed food-supply, it might be regarded as only a wise provision for the wants of these feeble creatures. But why they should change from one plant to another differing so greatly in nature as the elm from corn, to feed thereon during one of the phases of their life-cycle, is, indeed, strange and inexplicable. No wonder that acceptance was at first withheld from the announcement of the discovery,* and that it was only accepted when further evidence gave the indubitable proof that was demanded.†

Where the eggs of the hop-vine aphis, *Phorodon humuli* (Schrank) were deposited, has long been an important question in the economy of this destructive pest, which last year, almost entirely destroyed the hop crop of the State of New York. For years its eggs have provokingly eluded the most careful search made for them in the yards where the aphids had abounded; and it is only during the last autumn that, it is believed, they have been discovered attached to the terminal twigs of plum-trees, so curiously concealed as to have required the aid of a strong magnifier, together with a previous knowledge of the appearance that they should present, for their, as yet, somewhat uncertain detection.‡ The credit of this

Bulletin of the U. S. Geolog.-Geograph. Survey of the Territories, v. 1879, p. 2.

†*American Naturalist*, xv, 1881, p. 819–820.

‡Since the above was written, the life-history of this interesting insect has been worked out, *completely*, it is claimed, by Prof. Riley, Chief of the Entomological Division at Washington, and the assistants under his direction. The following is a brief summary: The eggs are deposited on the twigs of plum trees in the autumn (October). They hatch at the putting out of the leaves the following spring. Three generations follow on the plum, of which the last only is winged, which at once migrates to the hop-yards. The fourth and succeeding generations on the hop to the eleventh inclusive, are wingless females. The twelfth generation consists of winged males and females — the latter, agamic, and these return to plum trees in September. Here, the thirteenth generation is composed of sexual wingless females, which, after mating, deposit the eggs which are to hatch the following spring in continuation of the species. For a detailed statement of the above, see a communication made by Mr. L. O. Howard, of the Division of Entomology, under instructions from Prof. Riley, in the *Country Gentleman*, for November 17, 1887, p. 875, giving also, the latest studies of Prof. Riley upon the insect, made in England during the present autumn.

important discovery, if substantiated, will belong to Professor Riley. The identity of a species, *Aphis Mahaleb* (Koch), occurring on the sloe and plum in Europe, with the hop-vine aphis, has for some time been suspected, and, indeed, claimed by some writers, but it seems now to be upon the verge of actual proof. This plum-aphis, found for a short time in early spring (in May) on the plum, should not be confounded with the plum-tree aphis proper, *Aphis prunifolii* (Fitch), which infests the underside of the leaves of our native plums during the summer months, curling and wrinkling them.

Although much has been excluded from this paper that it was purposed to introduce in it, I have not the space to discuss the forms of which I have been speaking from their more practical point of view — the extent to which their increase and injuries are preventable, and the best means to be employed toward this end. These may be considered in another paper. In the meantime, if I have been able to show you the character and habits of the insatiate armies which so often invade your fields, orchards, and gardens, you may find in the knowledge that you have acquired of your foes suggestions for means of defense against them as efficient, it may be, as any that I could give you.

Ensilage Experiments in 1884 and 1885, at the New York State Experiment Station.

Paper read at the Annual Meeting, January 20, 1886,
By E. LEWIS STURTEVANT, M. D.,
Director.

The fact that we know so little that is accurate concerning agricultural reasons why and how, is the plea for the existence of experiment stations where investigations upon agricultural subjects shall take place. When this plea is considered, it will not seem surprising that those engaged in the investigations should acknowledge frequently that they do not know, and that they shall ever caution against placing too much stress upon the results of single trials or those derived from data which in their nature are uncertain.

The subject which I have selected for my remarks is the one of ensilage, not only as a matter having considerable importance in itself, but also as one which is prominently before the public and which is exciting much interest both at home and abroad. And yet in the remarks I am about to make I would have my hearers believe with me that we are not as yet thoroughly acquainted with the changes that take place in the silo, nor with the effect of ensilage used as a food. The experiments thus far made at the station seem to indicate that the effect of feeding ensilage changes in accordance with the quantity fed. It seems almost certain that when ensilage forms the leading diet of milch cows the results of the feeding are not satisfactory, the cattle in time showing the effects of an ill-nutrition. It even seems certain, if the testimony of good and unprejudiced observers is true, that the peculiar alcoholic features of the ensilage are reproduced in the milk from certain cows; while it seems equally true from our own experience that this fact has not been perceived in the milk of the cows fed upon ensilage at the station. The station results of feeding ten or fifteen pounds of

ensilage per day as an adjunct to other foods have been very satisfactory; and comparative trials most cautiously interpreted, and carried out with the most painstaking accuracy, have indicated that ensilage, when fed as an adjunct to other foods, has an equal value at least with the same material in an air-dried condition. The experiments carried out last year at the station in order to determine what effect acidified ensilage had upon its value as food, gave very clear responses to our questions. Sweet food purposely acidified with a measured quantity of acetic acid in about the same proportion as an analysis showed to exist in ensilage, gave better results as interpreted in milk and by live weight than did the same food without the acid, and the doubling of the acid ration was followed by an increased improvement in quantity of product. A careful examination into the kinds of food fed during the various periods showed that one apparent effect of the acid was to improve the appetite of the cows, and cause them to eat a slightly larger ration than they had been using previously. We are thus led to believe that so long as the acid fed is not in a proportion beyond what may be assigned to condimental relations, it is a valuable adjunct to food. When we notice that the use of ensilage as a sole food has not produced a satisfactory condition in the animals thus fed, we can hardly refrain from the belief that the feeding of the acid beyond its condimental properties is not advisable. In view of these facts that we have here presented as well as from a general impression obtained by reading the various opinions of those who have fed ensilage during the last few years, we are led to believe that ensilage must be considered as a valuable food when judiciously fed, and that in the hands of a judicious feeder it may possess a value superior to that of the raw material inasmuch as it contains the same amount of nutrition, in addition to a certain condimental effect upon the animal.

When we come to consider the arguments *pro* and *con.* regarding the advisability of establishing silos upon dairy farms, we are at once brought face to face with the question of profit; and it certainly seems to me that if it is requisite not only to build the expensive silo, which in itself may be legitimate, but to also be at the yearly expense of handling the large tonnage promptly, of cutting, trampling, and covering with heavy weights, that then the silo system must be condemned except in localities where labor is cheap, convenient, and at our call. If ensilage is to come into

general use by the farmer, it seems to me that it must not, in its storage, be the leading work of the season, requiring the neglect of all other work while the process is being carried on, together with the employment of additional labor.

Prompted by this view, in 1884, a cautious attempt was made to determine how little labor could be applied in the storage of ensilage, and yet good results be secured. The material used was corn and sorghum cut into three-fourths inch pieces, and put in in small quantities at a time. Thus the amount of fodder weighed in was as below:

	Pounds.
August 18. Corn and sorghum, mixed	3,121
August 19. Corn	3,259
August 20. Corn and sorghum, mixed	6,082

The silo was now covered and weighted, the planks being put on top of the filling, without the intervention of straw. September eighteenth, the weights and the planks were removed and 3,044 pounds of sorghum dropped in, and the whole then covered and weighted as before. On June 10, 1885, the silo was opened. The top was dark and musty for about six inches down, but the ensilage below the moldy portion was in an excellent state of preservation, and would be called first-class by those who are acquainted with ensilage products. It is thus observed that this method of filling was amply sufficient for the purposes in view, and was far cheaper than the method heretofore adopted of getting the material in as rapidly as possible, and of keeping several men at the bottom during the filling for the purpose of spreading and trampling. This success encouraged us to make a new trial, where the neglect should be excessive. Accordingly when we filled the silo in 1885, we determined to take no precautions whatsoever, and therefore the following amount of forage was tumbled in in inch pieces at the dates named:

	Pounds.
August 10. Dent fodder corn	1,813
August 11. Pop fodder corn	3,503
August 12. Flint fodder corn	4,437
August 13. Flint and sweet fodder corn	4,359
August 19. Pop fodder corn	5,166

Up to August twenty-eighth, the above fodder in the silo was not even covered. At no time had it been trampled except what was

necessary in order to level at the end of each filling. August twenty-eighth the planks were laid on. September third the planks were removed and 4,759 pounds of amber cane fodder dropped in. At this time the surface of the ensilage was somewhat dry, and a little decayed in some places, especially where the planks had rested rather heavily. At the depth of eight inches the ensilage was in excellent condition, but very warm and somewhat acid. On September fourth, 5,261 pounds of amber cane fodder was added, leveled and the planks laid on. The silo was now completed. The work had been done as convenience prompted, little or much being added as circumstances warranted without any regard to the requirements of the silo. No weights were used at all, and no covering except the planks, which were placed on more to protect from dust and dirt than for any other purpose. On November eighteenth, the planks were removed from a portion of the silo. The upper layer of the silage was very rotten, but had no putrefactive smell, the smell being rather that from a rotten and damp stump. At four inches down the silage was in perfect condition, and but very slightly acid. At six inches down perceptibly warm, as also at a foot deep. December ninth again examined, and no changes observed. On December nineteenth, in the presence of H. E. Alvord, an expert in ensilage matters, the silo was again examined in a different place from heretofore. About three inches of the upper portion was rotten, exhaling the odor of decaying wood, but nothing putrefactive. Below, the ensilage was in good preservation, not warm to the hand, quite strongly acid, but no more acid than has been ensilage formerly preserved under the most expensive precautions.

There is a difficulty in studying the products of the silo through the unevenness of the changes which are taking place. Thus, the heat varies in different layers and in different areas during the processes which follow the filling. The layer of decayed material varies to a slight extent in different parts of the area, as well as the amount of acid as determined by the smell. It thus happens that the testimony of different observers would be slightly different, provided each observer examined a different portion of the silo. In this case, however, all our examinations have showed what may be called successful preservation, and this trial demonstrates the possibility of storing ensilage without any special precaution in the matter of filling, and without the expense attendant upon the use of heavy weights. As I said, however, at the commencement of my paper, it is not wise to generalize from a single experiment, and I,

therefore, only bring this matter before the public as a proof of what may take place under given conditions, and allow the public to draw such conclusions as the experiment in itself may legitimately warrant.

I may be allowed, in conclusion, to refer to the results of some figures bearing upon the food value of ensilage when fed as an adjunct to other foods. When the ration was eighteen pounds of an even mixture of meal and bran, together with about seventy pounds of ensilage daily, and this compared with the same amount of grain with thirty pounds of the same dried fodder, which, put in the silo, formed the ensilage, and the same amount of grain with twenty pounds of hay, the following conclusions were justified by our results, viz.: That twenty-six pounds of fodder corn was the equivalent of seventy pounds of the ensilage or eighteen pounds of hay. Expressing these results in tabular form, using 100 pounds as the unit for comparison, we have:

One hundred pounds of ensilage was the equivalent of thirty-eight pounds of fodder corn.

One hundred pounds of ensilage was the equivalent of twenty-six pounds of hay.

One hundred pounds of fodder corn was the equivalent of 262 pounds of ensilage.

One hundred pounds of fodder corn was the equivalent of sixty-nine pounds of hay.

One hundred pounds of hay was the equivalent of 381 pounds of ensilage.

One hundred pounds of hay was the equivalent of 145 pounds of fodder corn.

From this table the value of ensilage can readily be calculated when used as an adjunct food under the circumstances as stated, and the relative values of our hay and our fodder corn can also be observed. We would not, however, have it understood that we recommend the proportions of ensilage as used in these trials. On the contrary, a wider experience would seem to indicate that for continuous feeding a smaller quantity of ensilage would be preferable, taking into consideration the questions of condition of the animal, and the profit which comes from feeding. Our present experience seems to justify the belief that in addition to hay and grain, about twenty-five pounds of ensilage can be fed daily per cow to advantage, as with this feeding we seem to obtain not only the nutritive value of the ensilage, but also its condimental value in influencing the appetite of the animal.

The Dairy Interests of the United States.

Paper read at the National Convention of Cattle Growers, at Chicago, November 18, 1885.

By PROF. HENRY E. ALVORD.

The first duty of the farming of this country is to provide our own people with food and clothing. The 50,000,000 enumerated five years ago have increased to more than 57,000,000, and will soon number 58,000,000. Allowing for the less necessities of children, there is still an equivalent of 50,000,000 adults to be supplied. That this increasing demand is well met, so far as quantity is concerned, is shown by the great surplus annually sent abroad of corn and wheat, cotton and meat. For twenty years agricultural products have constituted more than three-fourths of the total exports from the United States, while in single recent years this proportion has reached eighty-three per cent, and amounted in value to nearly $900,000,000. It is manifest, moreover, that this superabundance of agricultural production will continue, despite any possible increase in population during the present century. But the wisdom and economy of our present systems of production and disposition is a very different matter. One of our most acute statisticians and economists* has lately presented the startling fact that "the whole accumulated wealth of the country, aside from land, does not exceed two, or at most three years production;" and that the average product to each person in this most prosperous land, measured in money at the point of final distribution for consumption, does not exceed from fifty to fifty-five cents *per capita* per day. In other words, our total product or income, as a nation, is such that, after the necessary outlay to maintain our capital, and the payment of all taxes, there remains only enough to allow from forty to forty-five cents per day, with which to provide shelter, food and clothing

* Hon. Edward Atkinson, of Boston, before the American Association for the Advancement of Science.

for every one of our people. "This is the measure in money of all that is produced, and we can not have more than all there is." Plainly we have a very small margin to work upon, and it behooves us to husband all our resources; but, as a nation, we are not doing it. The fact can not be denied that even on the rich soil of the great State in which we are assembled, and much more in the older States east and south, the average production per acre is steadily decreasing. This is a very serious matter, and deserves careful consideration.

Vegetable products form the basis of all agriculture. To produce useful plants the soil must contain certain known elements as plant food. For any of these elements of fertility to be available, all must be present in the soil in fair proportions. Every crop removed from the land diminishes its store of plant food, and thus reduces its productive power. The process of constant drafts, without equivalent return deposits, is as certain to end in bankruptcy in farming as in finance, and it may be remarked, that similarly, those who have accumulations in the savings bank, as the result of years of toil and frugality, generally husband their capital, while those who inherit a large bank account are very apt to waste their patrimony. We boast of our great exportations of agricultural products, forgetting that this really means the sending to foreign lands of great blocks of our store of natural fertility, thus disposing of the main source of our agricultural wealth by the ton and by the million. When we export products which are sold for $800,000,000, this includes available plant food, all needed at home, which we can not replace for less than an expenditure of $50,000,000, or more than six per cent (240,000 tons of nitrogen at $340; 50,000 tons of phosphoric acid at $100, and 30,000 tons of potash at $100 — $50,000,000), and this fertility never comes back; it goes to enrich other lands, or be washed into seas from which we do not even get the fish and the kelp. Those of us who are contending with impoverished soils are well placed to appreciate the sober subject of agricultural exhaustion, and are fully justified in an earnest word of warning to those who labor on newer lands. "Uncle Sam" is an active and industrious body, with numerous irons in the fire, but his chief occupation is farming, and so it will be for many years. He is carrying a big debt, incurred in a good cause, and standing in the nature of a mortgage on his property. He is anxious to lift the burden; but it is a most mistaken policy to run down the farm, and

in order to leave his family debt-free, bequeath them exhausted soil and worn-out machinery. His wide-awake boys — aye, and generations more remote — will be far richer to have the fertility of the great farm maintained, and all kept in working order, even although a good share of the funded debt also falls to their lot.

With our rapidly increasing population and a constantly lessened fertility of soil, we have presented to us the gravest question in connection with our farming. By the wasteful processes prevailing, we are expending our very substance, and daily adding to a burden under which generations to come will stagger. The truly economic production of food and clothing for our people, and the wise arrangement and disposition of our surplus, are the great problems for the future of American agriculture. Political and social science must then be applied to the economic distribution and consumption of the products of the farm.

The researches of modern science have done much in establishing truths of practical value in our farming operations. None are more important than those which teach us the effect upon the fertility of the land of the removal of different crops and products, and hence what should be consumed at home and what may be profitably sold. Thus, if a ton of farm produce be removed from a western farm to an eastern market, or from any American farm to a European market, it makes a vast difference, eventually to the producer and the owner of the land where produced, whether this be a ton of corn or wheat, beef or butter. In just this difference lies the practical lesson that domestic live-stock, in due proportions and properly maintained, are essential to far-sighted, well-conducted and profitable agriculture. More live-stock, and better care of it, is the only salvation of our worn-out lands, the shortest and surest means of recuperation in the east, and the sole method of preserving the fertility of the west.

A careful study of the consumption of food by the great industrial classes in this country, both as to quantity and cost, shows that, approximately, computing our population as an equivalent of 50,000,000 of adults, $100 is annually expended for food and thirty dollars for clothing and household goods. Half the whole cost of food is assigned to animal products, thirty dollars for meat and poultry, twenty dollars for dairy products and eggs. This is widely at variance with the teachings of nutrition and domestic economy. The same food value, and in the form of a very satisfactory diet,

could be obtained for half this expenditure for animal food, although this may not be the place to encourage the idea. We are notoriously a people of an abundant and really extravagant diet, and it is doubtless better suited to this occasion to note that the great majority will prefer to continue expending twenty-five per cent more than is necessary for food, rather than give up their generous meat supply. We may satisfy our consciences if, while encouraging the consumption of animal products, we at the same time contribute to cheapening their cost.

By encouraging the increase of our herds within proper limits, by assisting in their protection from disease and disaster, by aiding in the consumption of vegetable products as near as possible to the place of production, the lessening of our surplus of breadstuffs, and increasing the home consumption and export of animal products, we so act as to not only maintain but improve the fertility of our soil, and actually do more than to make two blades of grass grow where but one grew before; and by reducing the first cost of animal products on the one hand, and lessening their cost to the consumer on the other, we may directly contribute to human welfare. If the fifteen cents which the average person in America daily expends for animal food could be reduced to twelve (as I believe it may, and with profit to the producer), the saving in the cost of living would be $1,500,000 a day, or enough to pay off the entire national debt before a president is again inaugurated. This work alone, or a beginning of it, is more than enough to justify this convention and the existence of the association under whose auspices we have met. In view of these considerations it may be justly claimed that this body holds a position of eminent patriotism and genuine philanthropy.

The products of cattle-growing in the primitive form were hides, horns and a little tallow. For the advance made in this industry witness the magnificent show of fat stock now in this city of Chicago. But we find here other products than beef, and I must hasten to the special duty assigned me of presenting the dairy interests of America. In a general way, the good old "rule of three" will apply, and it has the advantage of being short.

As general agriculture is to cattle-growing, so is cattle growing to dairy farming.

It is hardly necessary to even rehearse the proportions which dairy production and the dairy trade have assumed in this country.

We have the best evidence of the magnitude of this industry, and its high condition in the grand exhibition now in progress in this city, and the earnest convention of more than 1,000 men, which assembled here last week in the name of the three common articles, butter, cheese and eggs. Yet it may fairly be assumed that in the present meeting the predominating interest is in cattle of the beef making breeds, and in meat as the chief product. I should, therefore, fail in my duty if I did not attempt to make a good presentation of dairy cattle and dairy products, and the relative importance of this branch of the Cattle Growers' Association.

In round numbers our neat cattle represent half of the $2,500,000,000 invested in live-stock on the farms and ranges of this country. And of the cattle 14,000,000 or nearly one-third the whole number are milch cows. In value, these milch cows constitute a good deal more than one-third of the entire capital in cattle. To be conservatively safe, we may reckon the cows fairly classed as dairy animals at between 12,000,000 and 13,000,000, and these may be roughly divided as 8,000,000 butter cows, 1,000,000 for cheese and 4,000,000 for milk supply. Without counting the yearly increase in calves from milch cows, the aggregate products of the dairy are annually equal to the value of the dairy cattle themselves, being nearly, if not quite, $400,000,000. This exceeds the value assigned to all beef slaughtered, plus the live cattle exported, and is equal to half the estimated total meat products. The products of dairying, therefore, form at least three-fifths of the entire annual products of cattle growing in America.

In a classified list of the agricultural products of the nation, arranged according to values, meat stands first, corn second and the dairy third; wheat and hay come next; but with a few exceptions our dairy products for several years have been worth more than our wheat crop, and more than our hay crop. Our butter product alone is worth more than our cotton crop, and the milk we consume as food is worth as much as our crop of oats. The whole issue of national bank notes would not purchase the products of our dairies the present year, and the aggregate banking capital is less in value than the total products of cattle which are placed upon our markets every twelve months.

The development of American dairying exhibits the greatest progress ever made in any branch of agriculture, for it combines rapid growth with remarkable improvement. The application of

mechanical skill, and the activity of inventive genius, is an excellent indication of the advance of any industry in this country. Perhaps nothing shows our dairy development more than the fact that from the opening of the United States patent office (over eighty years ago) to the present time, there has been more than one application for every fortnight for a patent on churns, and during the last twenty-five years a new or improved churn has been invented every five or six days.

Our dairying was without unusual features until about 1870, and the great growth has occurred within fifty years. In that time the number of milch cows in the United States has tripled, and their products have quadrupled in value. It is within the memory of us all that, like the great American desert, the famous "dairy belt" has faded away and is heard of no more. The idea, so long maintained, that the profitable dairying of the country would always be monopolized by a district confined within certain narrow geographical limits, has been thoroughly exploded. It has been amply shown that good butter and cheese can be made, by proper management, in almost all parts of North America, between the thirty-second and fiftieth parallels, and perhaps this is drawing the lines too close. Generally speaking, the territory where good butter can be profitably produced is more extensive than that, with satisfactory conditions, for even limited beef production. Even the influences of climate, soil, water, and herbage are largely controlled, and what is lacking in natural conditions is supplied by tact and skill. We find some of the best records of dairy performances, both as to quantity and quality, of single animals and whole herds, in the higher latitudes of Canada and in lower Tennessee. In remote districts of Maine and Minnesota, on the plains of Nebraska, in the mountains of Colorado and California, among the old cotton fields of Mississippi, and in the high lands of Florida, dairying has assumed a commercial importance, and I know of establishments in all these places where butter or cheese, or both, have been made long enough, and with such success as to fully satisfy the owners and friends of these respective enterprises.

The factory system is the characteristic feature of American dairying, and the one to which this industry owes its greatest advance during the present generation. Jesse Williams began operating the first cheese factory in Oneida county, N. Y., thirty-five years ago, but it was fully ten years later before the system became at all

popular. Twenty years ago there were less than 300 cheese factories in all, and just about that time Alanson Slaughter started the first butter factory in Orange county, N. Y. In this State (Illinois) the first cheese factory was built in 1862, the first creamery in 1867; in Iowa the first cheese factory in 1866, and the first creamery in 1871. We all know the wonderfully rapid extension of this system during recent years. The census of 1880 enumerates nearly 4,000 dairy factories with a capital of $10,000,000 and a total product valued at $26,000,000, and reasonable estimates now place the factories at 6,000. It is true that, of all the dairy products of the country, only a very small portion are yet factory made, but equally true that, it is the factory which gives this industry its present commercial importance, and which marks the greatest advance of the century in the relations of dairying to the farmer and his family. It may be compared with the change from the wheel and the hand-loom to the woolen factory, and it is just as certain to be permanent. I can not at all agree with those who claim that, private dairying is now gaining on the factory system, either on the part of the farmer or as judged by the markets. We still see occasionally at our local fairs skeins of home-spun yarn and pieces of cloth which attract attention, and generally sell at prices above the market for choice factory products of a similar kind. This is partly the result of their rarity and partly because of intrinsic merit. So for years to come there will doubtless be single dairies in many places whose products will sell at exceptionally high prices, and probably deserve to; but the total of such sales will form an inappreciable portion of the general dairy market. Our factories are by no means perfect, and often fail to give satisfaction to their patrons. This, however, is no radical fault of the system, but results from errors of detail or of individual management. Improvements are needed and will be made, and dairy butter will become as scarce an article in our market as dairy cheese. I also expect to see great extension, of our cream-gathering plan, in butter-making districts. The combined butter and cheese factory has seen its best days, and one dairy product or another must be the sole output of the successful factory of the future. For the butter factory, pure and simple, skim-milk becomes practically a waste product, and the only system is to handle the cream alone. It is as absurd for the farmer to send away his whole milk to make butter, as it would be to drive his

flock to the woolen-mill, or for the planter to bale his cotton without ginning, and sacrifice the seed.

Great as the progress of dairy husbandry has been, there remains, as in all branches of animal industry, ample room for improvement. We are keeping too many milch cows for the aggregate product. The gain in this particular is fast, but not fast enough. But a few weeks ago a friend of mine, who was supplying milk in a large New England town, and where the dairy stock of the vicinity was good, made a standing offer of $100 for every cow which would give fifty pounds of milk daily for three days on his farm. This was almost double the price of the best dairy cows, but none of those presented reached his standard. Recently I periodically witnessed and verified the performance of a cow which, with her second calf, produced 100 pounds of milk a day for a month, and yearly records of 10,000 to 20,000 pounds are now by no means rare. The average milch cow of the United States (and by this I mean the cow kept for her milk product) does not yet give 400 gallons a year, and in special milk-making regions the average does not exceed 500 gallons. Yet, there are numerous single herds of ordinary breeding, but well selected, where the annual yield is from 800 to 900 gallons per cow, and others of pure bred dairy animals where the average ranges from 1,000 to 1,200 gallons per cow. These illustrations of the possibility of increasing our milk supply from a less number of cows apply as well to butter and cheese. It is certainly more than possible to so improve our herds that in a few years our present dairy production can be secured from half the number of cows we now feed. The improvement in progress in this direction, although slow, is very positive. From 1790 until 1860 the increase in number of milch cows kept even pace with the population, twenty-seven cows to 100 inhabitants was the ratio, which did not vary one per cent during these seventy years. But in this time production increased, so there came to be a surplus of products. Now with but twenty-three cows to every hundred people, our surplus is still greater. Our dairy interests will be better conserved by a decrease in the number of our cows and a gain in their quality, than by any increase in number, at least in the ratio to population.

The question of surplus in American dairy products is one of more or less uncertainty. A short time ago it seemed impossible for dairy production to be overdone for years to come. But for the

introduction of adulterations and substitutes for butter and cheese, there could yet be no surplus unfavorably affecting our markets. How far this substitution has extended, and its real effect upon the prosperity of dairying, it is impossible to determine. The export trade has been injured in some way, and undoubtedly in part by loss of reputation resulting from frauds in dairy products. And we know but too well the vast quantities of bogus butter and skim cheese with which our domestic markets have been flooded. I put these two classes of wares upon an equality as frauds. For the skim and half-skim cheese, dairymen are responsible, and the cheese trade has suffered as much, relatively, at their hands as the butter market has from bogus butter in its various forms. If our dairy markets could be freed once more from the cheap imitations of genuine butter and cheese, it is safe to say that our dairies could not produce a surplus for many years. But as matters stand the case is very different, and already perplexing enough. What shall be done on the part of our dairy interest to meet the insidious attack has become a very serious problem. It is an insidious attack and not open competition, because the imitations and substitutes are almost universally sold, at all events by the retailer, as pure butter and cheese. I lately heard a man declare, in New York, that with a moderate capital he was able, with his factory, to put as much "butter" on the market in a month as 30,000 dairymen. He called his product "butter," and just there lies the worst feature of the case. If the goods could always be made, sold and consumed with a full knowledge of their real character, the evil would be mainly removed, and little just ground for complaint would remain.

American-like the first appeal for the relief of dairymen from this new evil was made to legislation. But although laws in great variety have been enacted in different States to meet the case, the result is far from satisfactory. In New York we have tried the policy of prohibition. The statute, however, attempted to cover far too much ground, was drawn with a very superficial knowledge of dairy facts and needs, railroaded through the Legislature with no opportunity for deliberation and debate, and as a result, it proves very ineffectual, notwithstanding the creation of special officials, well supplied with money, to enforce the law. On the other hand, a State law of New York, requiring the branding of all cheese made in the State, to show whether it is a full-cream

article, or the degree of its impoverishment, is found to be easily executed, and has already done much to restore confidence in the market, and improve the quality of cheese-factory products.

As a rule, however, very little is to be gained by making new laws or matters of this kind. Markets are neither created nor supplied by Legislature. The danger of our time is the constant resort to legislative remedies for evils which can only be remedied by individual effort and industrial progress. The moment special legislation is sought, reciprocal alliances become necessary, and odd as it may seem, it is a well-established fact that in the work of "log-rolling," the farmer always comes off the loser.

Let me be fully understood as referring especially to legislation which is intended to affect the price of commodities and to benefit one industry or class of merchandise at the expense of another. Laws manifestly for the public welfare, to guard property and facilitate trade, are a very different matter.

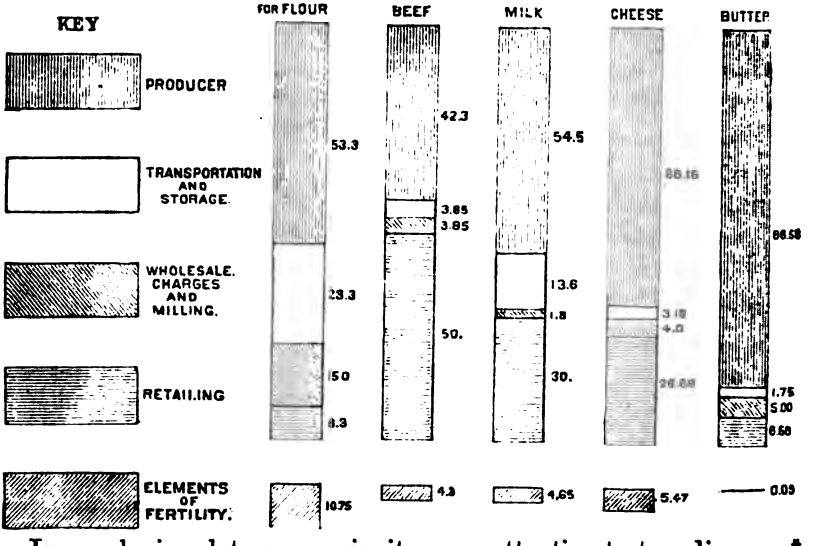
But to my mind the frequent cry of the farmer for protective legislation exhibits weakness and cowardice. It is especially so in the case of the dairyman. The cow has served us long and well, bearing a good reputation through the ages. I do not believe she is going to fail us now, through any *Armour-ous* entanglements with the western hog. Instead of whining and complaint, and seeking for some ally to stab or smother the enemy, let the dairymen rather challenge to an equal contest in open ground. Dairy imitations will continue to be made, and we can no more prohibit the sale or use of a mixture of lard and butter than of butter or lard alone. We may rightly insist upon abolition of all false pretenses, and this is practicable as a partial remedy. If, knowing what they purchase and consume, people prefer these adulterations and imitations to genuine dairy goods, we can not complain. Unfortunately it is a fact that, at present, of all the bogus butters on the market, a larger part are clean and palatable than of our real dairy butter. The most promising field of effort for dairymen is in trying to alter these conditions.

Instead of hasty appeals for protective legislation, let there be earnest and united effort on the part of dairymen and tradesmen. Improvement in our cattle, and economy in their management, resulting in dairy products of higher quality sold at reduced prices, are the measures surest to overcome competition from any substitute for pure butter and cheese.

At the same time, much needs to be done in varying the forms of our products, in educating consumers, and extending consumption. A recent careful study of the relative retail prices and nutrient qualities of all the common articles of food, showed that consumers can in no way get so much food value for their money as in the purchase of dairy products. Skim-milk, buttermilk and cheese, at their usual retail prices, are cheaper as nutritious food than any other articles on the long list, and are approached in this respect only by fresh mackerel and dried codfish. Butter, on the contrary, is a luxury rather than a food, and always sells for two or three times its real food value, and often more. Dairymen may be comforted by the fact, however, that Americans like butter as well as meat. It is one of our national extravagances. We are the greatest butter-eaters of any people in the world. The trouble now is that a very small percentage of consumers know what good butter is, and they are thus easily swindled and satisfied with a bogus article; but it is not difficult to improve the taste of the average consumer, and with a little effort he can be so educated as to absolutely reject the best concealed attempts to blend with superior creamery butter any of the adulterants now in use. It is a sad comment on the domestic economy of America, that while our people consume more butter *per capita* than any other nation, they are among the very smallest consumers of cheese. The cheese used in this country does not amount to three pounds per annum for each person, while in England the usual estimate is over twelve pounds, which is a greater rate *per capita* than the consumption of butter. There is no food better or cheaper than cheese, and its production and consumption in this country ought to be very largely increased. To accomplish this, two things are mainly needed. There must be more diversity of form and flavor, and, in some way, retailers must be made to content themselves with less than their usual fifty per cent profit. When a sixty-pound box of fine full-cream cheese can be bought at ten cents a pound in any of our large markets, the same article will be found selling within half a mile, at fourteen to sixteen cents a pound, sometimes eighteen, according to the style of the retail store. Well-made cheese in any form that is small enough to be taken by a consumer uncut is comparatively rare, and, when found, usually sells readily at quite high prices. I know a little cheese made in Otsego county, N. Y., in the Cheddar form, but weighing only three pounds; this, apparently because of its attractive size, sells at

wholesale in New York city for twenty cents a pound, when exactly the same thing, in the usual market form, will bring but thirteen or fourteen cents.

The consumption of milk as well as of cheese, particularly in our large towns and cities, is far below what it should be. Here again one of the chief obstacles is the retail price, although milk is comparatively one of the cheapest articles of food. But the business of milk supply is, as a rule, carried on in a most unsystematic and wasteful manner. Thorough reformation and reorganization are needed. This great field is a promising one for coöperative effort. The usual cost of final distribution, including the retailer's profit, is from two to three cents per quart, often more. Yet it has been demonstrated by well-managed milk associations in several places, notably at Syracuse, N. Y., and Springfield, Mass., that this service can be performed for one cent a quart, or even less. Then, again, the trade in skim-milk, the very cheapest form of food, is not half developed. A very mistaken idea generally prevails as to this article, and in many large cities, where its general distribution would be a public blessing, boards of health absolutely prohibit its sale, and actually destroy all skimmed milk that can be found.



In conclusion, let me now invite your attention to two diagrams* which graphically illustrate some of the points to which I have

* Only the second of the two diagrams referred to is printed.

already referred. The first shows the relative proceeds, at retail, in average domestic markets, of one ton each of flour, beef, milk, cheese and butter, and the apportionment of these proceeds between producers, transportation companies and wholesale and retail traders. It also shows the draught of these several commodities upon the fertility of the soil where made. The great advantages are here made apparent of sending vegetable products to market in the condensed form of beef, butter and cheese. The other chart gives the same general facts, but in a different way. It exhibits the distribution of every dollar paid by the consumer for flour, beef, milk, cheese and butter. The dairymen get a much larger share of the gross proceeds than the meat growers. The expense of transportation and wholesaling are comparatively small, but the share for cost and profit of retailing is unreasonably large, especially in the cases of cheese and beef. This is manifestly a place where reform is necessary. The black section below each colored column, drawn on the same scale, shows the part of the dollar received, which may be considered as meaning the elements of fertility which leave the farm with these respective products. Thus, as we can see, the grower of wheat should know that, out of every dollar received, ten to twelve cents represents the reduction of his capital in his soil, while the corresponding effect of selling butter is so small that it can hardly be shown on the diagram. It is less than one-tenth of a cent.

It is evident that the question of the ultimate effect upon the production of our lands is one which deserves to be always before us in determining what we will grow and what we will sell, and especially what shall be exported.

It may be claimed that economical and political reasons have justified, in the past, the cultivation of the soil at the expense of future generations. This wasteful culture has produced the accumulations which have provided all our apparent wealth other than land, and enabled us to make all our public and private improvements. "Thirty-eight noble States, in an indissoluble union," are the justification of this policy. Their school-houses and churches, their shops and factories, their roads and bridges, their railways and warehouses, are the fruits of the characteristic American agriculture of the past. But these excuses for wasteful systems no longer exist. The country in its arable parts is settled, and the line of population now rests near the base of the great

mountains which occupy so large a portion of the continent. The time has come when a continuance of this policy will be, not the improvement of our patrimony, but the impoverishment of our posterity. "Economical and political considerations alike demand that the soil bequeathed to this generation, or opened up by its own exertions, shall hereafter be deemed and held as a sacred trust for the American people through all time to come, not to be diminished or impaired for the selfish enjoyment of its immediate possessors."

A solemn obligation thus rests upon the farmers of this country, now and hereafter, and we may congratulate ourselves here to-day that in the performance of this manifest duty none are nearer the right than we who are engaged in dairy husbandry and the growing of cattle.

Forage Crops.

MAIZE AND SORGHUM.

By E. LEWIS STURTEVANT, M. D.

With the present interest in ensilage, the question of forage crops assumes an importance even greater than ever before. To such an extent has the success of the process of ensilage extended, that even in England the subject of maize growing for forage purposes is receiving attention. It seems apparent that this method of securing succulent cattle food for winter use has secured a permanency for filling a certain want under certain conditions, and that where its use is found advisable, the question of forage crops has a significance even greater than before its introduction.

The requirements of a forage crop for ensilage purposes seem to be those of succulency, large cropping capacity, nutritive property, and ease of growing and harvesting. The maize plant seems to fulfill these requirements in a higher degree than any other plant generally known to our agriculture. In its green state it possesses succulency, it yields great weight per acre when properly planted upon congenial and rich soil, it has an excellent nutritive value, it is adapted to machine culture and is easily handled and stored. In all these respects, including also its certainty almost of yielding crop, it surpasses all the American crops with which we are familiar, and its wholesomeness and palatableness to stock are beyond question.

In maize we have, however, a host of varieties, some early, others intermediate, and yet others late in maturing development; some dwarf, others tall, and yet others very tall; some with a habit of suckering, others with little tendency that way; some with small stalks, others with large and coarse stalks; some quite leafy, others little leafy; some little prolific in ears, others far more prolific; some whose lower leaves turn yellow and perish in their own shade, others in which this tendency is far lessened. What variety to

select for ensilage purposes is then important, as is also the question whether the variety is planted according to the requirements of its nature.

At the New York Agricultural Experiment Station in 1882, some twenty-five varieties of corn were under observation; in 1883, the number which might be considered as varieties was 128; in 1884, this number was increased to 133. We have enjoyed this opportunity for studying the plant habits, while in addition we have had larger plats grown for the purpose of studying the adaptability for circumstances of larger culture. The data obtained from these opportunities furnish the material for our remarks.

One of the difficulties in the way of obtaining the forage capabilities of a variety is the impossibility of verifying our results by close duplicates. Between plats of presumed equivalency variation will occur in the number of plants, as well as in the development of the plants themselves. Thus, three intended duplicates in 1883 yielded forage, the Southern White Flint variety, at the rate of 17.61, 14.89 and 15.53 tons, weighed as cut, per acre. We have here a variation between the plats of 2.72 tons per acre. In 1884 three plats of Waushakum Flint corn, the fertilization and treatment the same, yielded 16.20, 16.39 and 10.01 tons per acre—a variation of 6.38 tons. This variation may be accounted for in one of several ways, or by the united effect of the various assigned causes, viz.: 1, the difference between the number of kernels which vegetated and formed crop; 2, the difference in the fertility of the land; 3, the difference in the hereditary character of the seed in its interaction with climate. The second of these causes we have reason to believe interfered in the smallest yield of 1884, but not in the other cases. I mention this attempt at duplication, as it is of importance, since until we can secure quite close duplication in our trials for the purpose of checking our interpretation of variation, we can not be sure of the value of the numerical results, attained in experiments designed to give expression to the value of differences.

In 1883, while noting the habits of the growth of the corns, we were impressed with the appearance of some of the pops. The common eight-rowed white, or New England, developed a plant about five to six feet tall, leafy and prolific in ears, the lower leaves not withering, the stalk small; and it was thought that with close planting this variety might be available for forage. Accordingly,

in 1884, several plats, which were considered in uniform condition, were prepared and planted with New England Pop, Stowell's Evergreen Sweet, Waushakum Flint and Minnesota Dent corn, the pop-corn in drills half distance, or twenty-two inches apart; the others at full distance, or the drills forty-four inches apart. The yield of forage was 11.06 tons per acre for the pop, 7.95 tons per acre for the sweet, 10.01 tons per acre for the flint, and 10.57 tons per acre for the dent. We note that in this trial the pop-corn leads in quantity, but with closer planting.

Observations made upon the growing plats indicated that all the corns might have been planted somewhat thicker in the drill with advantage, or more than twelve kernels to the foot, as under circumstances of practical planting all the seed does not vegetate, and that perhaps eighteen or twenty plants to the foot in length for the most of the varieties, would, on fertile soil, produce better results. With the pop, on the contrary, we would more than double the thickness of planting for the best result, or use thirty or forty kernels to the running foot, retaining the half-distance of the drills. In this case we have reason to believe that the apparent superiority of the pop in quantity of yield would not only be maintained but increased, as we observe that with thickness of planting upon fertile soil comes an increase of height.

This pop-corn has smaller stalks than the corn of the other kinds planted and hence is more easily cut. It becomes a question for trial to determine whether on this account it can not be cut by machine and thus the expense of harvesting be diminished. It would appear as if a cutter designed for this purpose would find a demand and accomplish a great saving, as the character of this crop is such that while lying in winrows the stalks could be transferred to a wagon more readily than can the taller and coarser kinds now so universally recommended.

The nutritive value of a forage crop is dependent somewhat upon the stage of maturity and the character of the growth. Thus, for analytical results, the average of five stalks taken on August 18 and September 23, 1882, from the same field and carefully selected in the beginning and at the collecting as duplicates, gave the following figures:

WAUSHAKUM CORN PLANTS GROWN IN HILLS.

	AUGUST 18.		SEPTEMBER 23.	
	As taken.	Calculated dry.	As taken.	Calculated dry.
Water	86.05	.....	69.67	.....
Ash	.66	4.76	.91	2.98
Albuminoids	1.42	10.30	2.72	8.96
Crude fiber	3.82	27.44	6.12	20.17
Nitrogen—free extract	7.73	55.23	19.69	64.96
Ether extract (fat)	.32	2.27	.89	2.94
	100.	100.	100.	100.
Weight of plant	2.006 lbs.		2.389 lbs.	

We thus observe that there is an increase in total weight of the stalk as maturity progresses, that the water decreases and the apparent richness increases, but that when calculated to the dry condition, the albuminoid is lessened as expressed by the percentages; yet if we calculate from the total amount contained we have per 100 pounds of plant, 2.42 pounds of albuminoid August eighteenth, and 6.49 pounds on September twenty-third, an increase depending, in fact, upon the maturation of the grain. With ensilage corn, planted thickly and in which the ears do not usually ripen, this difference would probably not be so marked; yet we may reasonably and legitimately believe not only that the total weight of crop tends to increase as maturity approaches, but as well the nutritive value of the crop, up to the period at least when the tissues begin to harden.

We have some analyses of the whole plant of the same variety of corn, the Waushakum, planted in drills for forage and in hills for crop. The figures are as below:

	PLANTED FOR FORAGE.				PLANTED FOR CROP.	
	Analyzed August 19, 1884.		August 20, 1884.		Analyzed August 18, 1882.	
	Fresh.	Calculated dry.	Fresh.	Calculated dry.	Fresh.	Calculated dry.
Water	79.59	.....	80.62	.....	86.05	.....
Ash	.72	3.55	.68	3.52	.66	4.76
Albuminoid	1.70	8.35	1.54	7.94	1.42	10.30
Crude fiber	4.77	23.35	5.09	26.28	3.82	27.44
Nitrogen—free extract	12 69	62.14	11.46	59.13	7.73	55.23
Ether extract (fat)	.53	2.61	.61	3.13	.32	2.27

We note here that there is not uniformity of composition between the two samplings of 1884, and that the plants grown in hills in 1882 are richer in albuminoid and contain less starch, etc., than those grown in drills. These differences are to be expected from the analyses not necessarily representing the same stage of maturity and as applying to plants grown with different degrees of crowding. The corollaries to these facts are that a single analysis can hardly be expected to give figures for the calculation of the nutritive value of a crop, and that we should expect differences between analyses of various crops which shall arise from their different stages of maturity, as well as from the sampling not being from plants precisely equivalents in all cases; for in every field of corn there is a variability which arises from the irregular inherited habits of the seed, one seed producing a plant earlier to bloom than another seed.

The composition of the dry matter of whole plants of several varieties of forage corn, the various kinds being taken from adjoining plats under equal treatment, except as explained for the pop which was planted at half distance of drill, is as below:

	New England Pop.	Waushakum Flint.	Evergreen Sweet.	Minnesota Dent.
Ash	5.19	3.52	5.11	4.72
Albuminoid	7.50	7.94	8.81	10.31
Crude fiber	35.53	26.28	31.44	35.78
Nitrogen—free extract	49.05	59.13	51.97	46.76
Ether extract (fat)	2.73	3.13	2.67	2.43

The total dry matter yielded per acre and the pounds of albuminoid, the one ingredient upon which values are usually based, was:

	Dry matter per acre, lbs.	Albuminoid per acre, lbs.
New England Pop	2,780	208
Waushakum Flint	3,880	308
Evergreen Sweet	3,103	273
Minnesota Dent	3,761	387

This table shows us that although the pop-corn gave the largest actual yield, yet it was exceeded by the other varieties in nutritive yield on account of its greater percentage of water and on account of the lowness of its nitrogenous constituents. Unfortunately, we had but a single sampling of these crops, and hence we do not know how much variation is to be ascribed to the fact of the pop-corn being cut at a less proportionately ripe state, from its nearness of planting, than the rest. We can only say our figures show the relative value of the crops in the order of dent, flint, sweet and pop, and that our preliminary remarks show that variation arises from the different stages of maturity and the character of the plants taken for analysis.

I have given our results under this form with a purpose of showing the uncertainty of a single experiment, and the difficulty of drawing conclusions therefrom which harmonize with our observations. For my hearers will see for themselves that I believe pop-corn is worthy of practical trial, as a forage crop, and that when planted more thickly and allowed to ripen more than when these analyses were made, it will prove of value. It will also be seen that I do not recommend it at present for more than experimental trial.

While the common pop is good, yet it seems proper to observe that the rice pop offers even greater promise, as upon the average while the common pop has eleven to twelve leaves when grown in hills, the rice pop has thirteen, and is moreover a little taller growing.

A paper on forage crops would be manifestly incomplete without mention of sorghum, a plant with many of the characteristics of growth that corn has, but feebler in its earlier stages, more rampant growing in its later stages.

Sorghum presents varieties which differ even more in habit than does corn. Early Amber, the variety most grown for sugar pur-

poses, is far less prolific of foliage than are others which are sometimes grown. Thus, in 1882, the product of 100 seeds of Early Amber, fifteen plants per foot of row, was 102½ pounds, and of 100 seeds of White Mammoth, sixteen plants per foot of row, was 301½ pounds. Our trial of the forage value of sorghum upon a larger scale than the above have been made with Early Amber seed, on account of the difficulty of procuring seed of other sorts.

In 1884 the yield of forage upon a plat which was intended to be a duplicate of the corn plats already reported upon, was 22.54 tons. Two plats in hills yielded 12.08 and 19.27 tons of green forage per acre, a variation of 7.19 tons. Of these plats we have the previous history for three years. In 1881 sod. In 1882, 1883 and 1884, crops as below:

Plats.	1882. Bushels corn.	1883. Bushels potatoes.	1884. Tons green sorghum.
C. 5	62.2	222	22.54
C.11	84.3	301	12.08
C.12	52.2	233	19.27

The corn crop on C.11 in 1882 was unripe, and hence the calculated yield is somewhat in excess of the true yield. We, however, note that there is no relationship between the gross yields per acre for the different years for C.11 and C.12, which were duplicates. The greater yield of corn and potatoes in 1882 and 1883 was succeeded by a smaller yield of sorghum, and *vice versa*, another illustration of the difficulty of obtaining duplicates in plat experimentation. The apparent results of the figures, however reviewed, is that in comparison with corn, sorghum is superior in quantity of forage. In these cases there was a thicker planting in the drills than with corn, for sorghum will endure it, but the drills were the same distance apart as with corn. The composition of the richest forage corn and of the sorghum is expressed below:

	MINNESOTA DENT.		EARLY AMBER CANE, 1883.	
	Fresh.	Calculated dry.	Fresh.	Calculated dry.
Water	82.21	.....	75.04	.....
Ash	.84	4.72	.69	2.77
Albuminoid	1.83	10.31	1.03	4.13
Crude fiber	6.37	35.78	5.81	23.26
Nitrogen — free extract	8.32	46.76	17.03	68.22
Ether extract (fat)	.43	2.43	.40	1.62

These analyses are subject to the same limitations as we have heretofore referred to, but using the face of the figures we have for the yield of the plats that were intended duplicates:

	Total dry matter per acre.	Albuminoid per acre.
Minnesota Dent corn	3,761 lbs.	387 lbs.
Early Amber cane	11,252 lbs.	464 lbs.

Results manifestly in favor of sorghum for forage growing, even with a variety which seems not best adapted to the purpose. In this calculation, however, we take no account of the feeding quality of the food.

In a trial with corn and sorghum planted in alternate rows, the corn yielded more weight than the sorghum in one case, and the same weight in another. The total yields of the two plats, although intended as duplicates, were as variable as we have heretofore noted, 13.17 tons and 18.05 tons per acre respectively. The mixed crop was analyzed and found to contain:

	Fresh.	Calculated dry.
Water	82.41	.....
Ash	.83	4.70
Albuminoid	1.47	8.38
Crude fiber	4.73	26.91
Nitrogen—free extract	9.96	56.60
Ether extract (fat)	.60	3.41

And this indicates a higher value to the sorghum than is given by the analysis already quoted, for the analysis of the dry corn fodder of the same variety, as already quoted, gave 7.94 per cent and 8.35 per cent of albuminoid, the amber cane of 1883, 4.13 per cent, and the mixed crop as above, 8.38 per cent; another instance showing the difficulty of generalizing correctly from few samples, but the indications being, of a greater value for the sorghum than by our figures already given. In conclusion, we may offer the data of our forage yields in tabular form.

	Total per acre green forage. Tons.
Six plats corn in drills, average	12.03
Six plats corn in drills, greatest	16.39
Six plats corn in drills, least	7.95

	Total per acre green foliage. Tons.
Three plats cane in drills, average	17.96
Three plats cane in drills, greatest	22.54
Three plats cane in drills, least	12.08
Two plats cane and corn in drills, average	15.61
Two plats cane and corn in drills, greatest	18.05
Two plats cane and corn in drills, least	13.17

We can not, therefore, question that in our trials sorghum gave larger crops than corn, but we must be cautious about accepting the results of one year, or of one method of trial.

Commercial Fertilizers.

SUMMARY OF RESULTS OBTAINED AND OBSERVATIONS MADE AT THE EXPERIMENTAL STATIONS OF THE HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND.

[From the Transactions of the Society for 1886.]

By Dr. A. P. AITKIN,
Chemist to the Society.

The main facts that have been demonstrated and illustrated by the experiments of the society have formed the subject of annual reports in the Transactions, and have been pointed out and discussed on frequent occasions on the grounds of the experimental stations.

Now that the experiments have reached the term originally allotted to them, I take the earliest opportunity to present to the members of the society a summary of the results obtained in a short sententious form, stripped of the numerical details which figured so largely in the annual reports, and which may have served to repel rather than to attract the general reader.

During the course of the experiments questions of interest arose which did not quite fall in with the society's original scheme. These formed the subject of collateral experiments, which were conducted partly on the odd pieces of ground on the stations, or on adjacent fields, and partly on the farms of members of the society, who, not once or twice, but year after year coöperated with me in testing the specific character of various manures, and thus materially aided in controlling and enlarging the results aimed at in these experiments. The experiments at the society's stations were commenced in May, 1878. Their object was to determine the relative crop-producing value of the chief kinds of phosphatic, nitrogenous and potassic manures in common use, when applied year after year to land under a rotation of turnips, barley, grass or leguminous crop, and oats. The experiments were to last over two

rotations, so that any disturbances due to former manuring, that might interfere with the reliability of the results obtained in the first rotation, might be obliterated in the second one. The forms of phosphatic manure experimented with were:

- Mineral phosphates ... . — Carolina land phosphate; Canadian apatite; Curacoa phosphate; Aruba phosphate, etc.
- Of remote animal origin ..... — Phosphatic guano; Coprolites.
- Of recent animal origin ..... — Bones, in various forms; Bone ash.

These were applied in a finely-ground state and also after having been dissolved in sulphuric acid.

The forms of nitrogenous manure were:

- Soluble ..... — Nitrate of soda; Sulphate of ammonia.
- Insoluble ..... — Meat meal, Dried blood, Horndust, Keronikon, Shoddy or wool waste. (Animal origin.) Rape cake dust, Cotton cake dust. (Vegetable origin.)
- Guanos, etc ..... — Peruvian guano; Ichaboe guano; Fish manure; Frey-Bentos manure.

The forms of potash manure were: Sulphate of potash; muriate of potash.

The plats on the stations were each one-quarter acre in extent.

The quantities of the manures applied to the principal plats of the stations were so arranged that each plat received a uniform quantity of phosphoric acid, of nitrogen and of potash, whatever might be the form in which these were applied and irrespective of the gross weights of the substances or of their market prices.

When the crop was turnips or beans the manures applied to these plats contained:

	Pounds per acre.
Phosphoric acid	160
Nitrogen	40
Potash	120

When the crop was barley or oats the manure contained:

	Pounds per acre.
Phosphoric acid	80
Nitrogen	40
Potash	60

The plats on which the various phosphatic manures were tested received in addition their proper quantity of potash in the form of a mixture of muriate and sulphate, and their nitrogen, in the form of nitrate of soda. The plats on which the various nitrogenous manures were tested received in addition their proper quantity of phosphoric acid in the form of superphosphate, and their potash, as mixed sulphate and muriate.

The plats on which the two potash salts were tested received their proper quantity of phosphoric acid as superphosphate, and their nitrogen as nitrate of soda. The great majority of the plats on the stations were thus fully manured, and in so far as the essential ingredients — phosphoric acid, ammonia and potash — were concerned, they all fared alike. It was only the outward and accidental form and fashion of these substances that differed.

In order to form a starting point or basis of comparison for the whole station, three plats received no manure whatever.

In order to measure the specific effects of each of the three essential ingredients, three plats received one of each and nothing else, while from other three plats each of the three essential ingredients, respectively, was withheld.

For additional details regarding the scheme of experiments, the mode of carrying them out, the plans of the stations, and the analytical work connected with the experiments, reference must be made to the volumes of the Transactions from 1878 onward.

CONCERNING PHOSPHATES, NITROGEN AND POTASH.

1. A manure containing phosphates, nitrogenous matter and potash salts may, on ordinary soils, be regarded as a complete manure; and all that is needed to make it an efficacious manure is to have these three ingredients presented in such forms that the plant can use them, and in such quantity as to supply its needs.

2. On ordinary soils, and under favorable conditions, full crops may be grown by the use of these three substances without dung.

3. In order that full crops may be grown by the use of these substances, they must be applied, one or more of them, every year.

4. The proportions in which they should be annually applied, depend chiefly on the rotation of cropping.

5. The absolute, as well as the relative, amounts of each of these substances that are most suitable and economical to use for any crop as manure must be determined by experiment. Neither the analysis of the crop, nor of the soil, yields sufficient information.

6. When any one of these three constituents is withheld from the land during a course of years the fertility diminishes.

7. The want of one of these constituents can not be compensated by the more liberal application of the other.

N. B.—There are other substances, viz.: lime, magnesia, oxide of iron, and notably organic matter, which are important for the growth of crops, and which are assumed to be present in adequate amount in what are called "ordinary soils."

CONCERNING PHOSPHATES.

Natural Mineral Phosphates.

8. The utility of these phosphates when applied as manures in their natural state depends on two things:

(1) The softness of the mineral;

(2) The degree of fineness to which it is ground.

9. The softest of these minerals are most suitable for manure, because, when subjected to the same amount of grinding they contain a larger proportion of exceedingly fine flour, and they are more easily dissolved by the roots of crops.

10. The same mineral phosphate in two different states of fineness, such as are found in the market, may prove a successful manure in the finely ground state, and a failure in the other.

11. Mineral phosphates are ground to powder mainly with the view of supplying the manure merchant with material for the

manufacture of superphosphate. The degree of fineness requisite for that purpose falls far short of that required by the farmer who wishes to apply the manure directly to the land.

12. The ground mineral phosphates employed in the experiments were the finest that could be procured each year, but they differed in fineness from year to year, and their success as manures fluctuated correspondingly.

13. Too great importance may be attached to the relative success of different forms of ground phosphate applied in different years and to different crops. The phosphates which have produced the best results at the stations are Carolina land phosphate, Belgian phosphate and the Aruba phosphate, but they were also the finest ground.

14. Phosphatic guano has produced better results than artificially ground phosphates. From five to ten per cent of the phosphoric acid it contains is present in the form of "precipitated phosphate," which is rapidly taken up by the roots of the crop.

15. Precipitated phosphate—an artificially prepared phosphate—is by far the most active of insoluble phosphatic manures. It is not liable to variation, and surpasses in fineness all ground phosphates, however finely ground.

16. Bone ash, as supplied for agricultural purposes, and as supplied on the stations, is not so active as most other finely ground phosphates.

17. Ground phosphates have produced better results in wet seasons than in dry ones, and are more suitable for wet districts.

18. Ground phosphates act most surely on land rich in organic matter.

Superphosphate.

19. Superphosphates are of three kinds: Low, medium and high.

20. The safest and best for ordinary purposes is the medium superphosphate, which forms the bulk of the superphosphates manufactured, and contains from twenty-six to thirty per cent soluble phosphate equal to nine to fourteen per cent of soluble phosphoric acid.

21. A low superphosphate is not sufficiently removed from a ground phosphate to warrant its recommendation. It usually contains a large percentage of insoluble, coarsely ground mineral phosphate.

22. A high superphosphate usually requires careful handling, for it is difficult to get it in a dry powdery condition. It usually

coheres into lumps even when being spread, and all lumpiness in a manure is an extravagance. If fine and dry, it is excellent.

23. Superphosphate is a more active and, upon the whole a more effective form of phosphate than any other.

24. The form of insoluble phosphate which approaches nearest to it in activity, and which (if the superphosphate is not in fine dry condition) may surpass it in efficiency is precipitated phosphate.

25. Superphosphate can be made more easily from some kinds of mineral phosphates than from others. It is a matter of no importance to the farmer from what kind of mineral it has been made, so long as it is fully dissolved, and in dry, powdery condition.

26. The quantity and quality of the crops produced by the application of various kinds of superphosphate show no marked difference.

27. The rapidity with which superphosphate becomes available for the use of the plant makes it peculiarly suitable for application to spring-manured cereals, and all short-lived crops.

28. The chief advantage which superphosphate has over ground phosphates is the rapidity with which it forces the young plant, a matter of the greatest importance in the growth of most crops.

29. The production of an early, vigorous braird is an advantage that can hardly be overestimated. It means the establishing of the crop; it enables the crop to make its organic matter during the more favorable period of the season, and it hastens the time of its ripening. An advance of even a few days in harvest thus attained favors the securing of the crop in good condition. These results were very manifest where superphosphate was employed as the phosphatic manure at Pumpherston.

30. The advantage of superphosphate over other forms of phosphate is most conspicuous in dry seasons.

31. Superphosphate is not liable to be washed out of the land in wet seasons. The constituent of the manure that is liable to be washed out of the soil in wet seasons is the nitrogen.

32. Superphosphate may, therefore, be applied to the land some months before the crop is put in. This was done at Pumpherston with marked advantage to the turnip crop.

33. Superphosphate, whether owing to its rapid action or its more wide-spread distribution through the soil, or both, produced a more even crop than ground phosphate.

34. The land manured with superphosphate was always cleaner than that to which ground phosphates were applied. This was probably due to the rapid early growth of the crop, which discouraged the growth of weeds.

The question of soluble *versus* insoluble phosphates as a manure for crops of all kinds has been very hotly discussed of late years. The experiments at the society's stations were designed to provide some information on that subject.

The conclusion I have come to on this matter, as the result of these and many smaller collateral experiments, is that the whole question as between soluble and insoluble phosphates is mainly reducible to one of fineness of division or grinding, and consequent evenness of distribution. If phosphates could be ground down to a powder as fine as precipitated phosphate, there would be little need to dissolve them, unless, indeed, that were found to be a cheaper method of attaining fineness. It is impossible to grind phosphates so finely as that by any mechanical means, but it has not been proved that phosphates require to be so exceedingly finely ground as that in order that they may satisfy the immediate wants of the plant.

What is required is, that the phosphates should be so finely ground that they may yield to the solvents contained in the soil, and in the roots quickly enough to supply the plant with as much phosphoric acid as it needs at all periods of its growth.

The fact that ground phosphates, comparatively coarsely ground, do sometimes, and in some soils, act as quickly as superphosphate in promoting the growth of the plant, shows that if only a certain degree of fineness is given, the solvents in the soil are able to do the rest, and prepare the phosphate for absorption by the plant as quickly as it can take it up.

Soils differ in their powers of dissolving phosphates, but it is probable that if we were to push the process of grinding as far as we can by mechanical means, and perhaps by selecting for the purpose only those phosphates which are of a soft and easily pulverized kind, we should be able to attain a degree of fineness which would be sufficient to enable the solvents contained in any soil to act upon the phosphate quickly enough to supply the wants of the crop. To dissolve it quicker than that is manifestly unnecessary.

The great diversity of opinion between experimenters on this vexed question is chiefly owing to the fact that while well-made

superphosphate of a certain composition is the same thing all the world over, ground phosphates of the same composition may differ enormously in their fineness of division, and the results obtained by their use will be correspondingly different.

I strongly incline to the opinion that, with a more thorough system of grinding so as to produce a powder of standard fineness, the dissolving of phosphates might be in very great measure dispensed with. What that standard of fineness should be must be determined by experiment, but it would require to be such as to produce a phosphate available for all soils, so that farmers might employ it with as much confidence and certainty as they now use superphosphate. It does not seem as if the nature of the phosphate (so long as it is not an injurious phosphate) has much to do with the question, except in so far as some phosphates may offer greater facilities than others for fine grinding.

In the meantime, and until that shall have been proved, and so long as mineral phosphates are supplied in powder of various coarseness, superphosphate is the most reliable kind of phosphate for general use.

That the advantage of fineness of division attained by the use of superphosphate is secured at the cost of injury to the character of the soil from the enormous addition of sulphuric acid accompanying the manure in the form of sulphate of lime, is an opinion held by some, and the prevalence of certain forms of disease has been ascribed to the sulphate, but I have not been able to detect any such injury on the society's stations. On the contrary, the plats receiving superphosphate have been remarkable for the health and vigor of the crops grown on them.

Bones.

Bones have been applied in the following forms: Crushed bones, bone dust, bone meal, fine bone meal, steamed bone meal, and steamed bone flour.

35. The finer that bones are ground the more active are they, and the coarser they are ground the slower are they.

36. Crushed bones when not mixed with fine bone powder scarcely affect the immediate crop.

37. When mixed with finely crushed bone matter resembling meal, they are active and useful in proportion to the amount of meal they contain.

38. Bone dust is a coarse bone powder superior to the former in activity, as it contains more fine powder.

39. Bone meal well prepared, and consisting largely of fine bone meal, is a valuable manure. It is more active than the former, but nevertheless, a slow manure.

40. It is best suited for slow-growing crops, such as turnips, but is not active enough for cereals generally.

41. Bone meal is chiefly valuable as a phosphatic general manure for raising the condition of the land.

42. Steamed bone meal is a kind of bone meal which is variously prepared. It has no appreciable advantage over fine bone meal.

43. Steamed bone flour is the most active of bone preparations. As a phosphatic manure, it may be compared with the finest ground phosphate, but it has not been so successful at the stations.

Dissolved Bones.

44. Pure dissolved bones, when well made and containing no lumps of undissolved bone, possesses qualities which have deservedly made it the popular favorite among dissolved manures. This arises from the fact that it contains both phosphates and nitrogenous matter partly in a soluble and partly in an insoluble condition. The part which is soluble may have no advantage over superphosphate of any kind, and the dissolved nitrogenous matter may have no advantage over other soluble nitrogenous manures, while the insoluble constituents are no better than — they are not so good as — bone meal, but the convenient combination of these two constituents in a condition partly soluble and partly insoluble, gives the manure the character of a general manure capable of benefiting all crops at all stages of their growth, and of exerting an influence on the growth of succeeding crops.

45. The plat manured with dissolved bones has always been a good plat, and after eight years it is now one of the best plats on the stations.

This manure does not contain so much nitrogen as was required to make it compare with the other plats receiving a full manuring and that deficiency was made up annually by the addition of a certain amount of nitrate of soda.

46. Unfortunately, it is difficult to make pure dissolved bones in fine sowable condition, and thus the cost is considerable, and the temptation to make a spurious article is very great. It probably

possesses no advantage over a mixture of very fine bone meal and superphosphate.

47. For general purposes very fine bone meal is to be preferred to all other kinds of bone manure, especially for root crops, and for raising the general fertility of the land. It is a phosphatic and also a nitrogenous manure, and has the advantage of being less liable to adulteration than other general manures.

Its deficiency in nitrogen and potash was made up by the addition of a little nitrate of soda and a proper proportion of mixed potash salts, so as to make the bone meal plat comparable with the others on the stations. The bone meal plat has gone on improving from the first.

CONCERNING NITROGENOUS MANURES.

Nitrate of Soda.

In order to properly appreciate the action of nitrogenous manures, it is necessary to keep in view that it is chiefly if not entirely, in the form of nitric acid compounds—*i. e.*, nitrates—that plants take up their nitrogenous food, and that nitrates are all soluble in water.

48. Nitrate of soda is the cheapest and almost the only ready formed nitrate used as manure. It is a true manure. The name "stimulant" frequently applied to it, is a popular error, based on a misapprehension of its character and use as a nourisher of plants.

49. It is the most soluble and most active nitrogenous manure at the command of the farmer, and these characters determine the circumstances in which it should be used, and the mode of its application.

50. Its solubility is so great that it spreads immediately through damp soil.

51. The chief agent in preventing nitrates from being washed out of the soil in wet weather is the roots of the crop. These absorb the nitrates, and convert them into various nitrogenous substances, but especially into albumen, that most valuable of food constituents.

52. Plants are able to take up nitrates by their roots only when phosphates in a readily available form, and potash salts, are present in the soil.

53. The object a farmer has in view in applying manure is to produce a full crop; and when the soil contains sufficient available phosphate and potash for that purpose but is deficient in available

nitrogen, it is impossible to obtain a full cereal crop without the aid of a quick-acting nitrogenous manure, such as nitrate of soda; and it is when applied to the extent of producing a full crop that its use is most profitable to the farmer and to the land.

54. Nitrate when applied to a thin soil in a wet district, before the crop is growing on the ground, is simply thrown away. When applied to a soil poor in phosphates or potash salts, or both, it is of little use to the crop.

55. When applied to land rich in available phosphate and potash salts it enables the crop to make use of these, and to grow to the stature of a full crop.

56. When applied too liberally on good land it causes a rapid growth of ill-matured vegetable matter, and produces a crop which is too abundant, unable to ripen, of poor feeding value and liable to accidents.

57. The frequent application of nitrate to ordinary soils, without a due application of phosphates and potash salts, will result in the production of gradually diminishing crops from the exhaustion of the phosphates and potash of the soil. This practice has given nitrate of soda a bad name, but it is the abuse and not the use of nitrate that is detrimental to the crop, and to the fertility of the soil.

58. The judicious use of nitrate, along with or alternating with phosphates and potash, may raise the fertility of the soil and accumulate organic matter in it; for, while increasing the over-ground crop, it correspondingly increases the underground roots, and abundance of root residue in the soil means accumulation of organic matter.

59. Any unexhausted fertility due to the application of nitrate of soda will remain as a residue, not in the form of nitrate but in the form of nitrogenous vegetable root debris.

60. Nitrate is immediately available to increase the growth of the crop in its youth, when it is most vigorous, and, as a consequence, that increase takes place in the stem and leaf to a greater extent than in the other parts of the crop.

61. An overdose of nitrate abnormally increases the stem and leaf to the detriment of the other parts of the plant. Nitrate may, therefore, be used with greater impunity to crops which are grown for the sake of their stem and leaf — chiefly and notably to grass of one or two years duration.

62. Nitrate, when applied to plants grown for their seed, must be used more sparingly; for increase of stem or straw, if overdone, is secured at the expense of the seed, both in quantity and quality.

63. Nitrate in small quantity is a valuable adjunct to the manure used for plants whose youth is precarious, and for the success of which a vigorous start is advantageous.

64. When applied with the seed, nitrate must be used in very small quantity, for two reasons: Firstly, because a braird, when grown too rapidly, is soft and weak, and liable to frost and blight; and secondly, because the application of nitrate to the ground causes loss in wet weather. The loss is the loss of nitrate.

65. Nitrate is most economically applied when the roots of the crop are there to receive it, and prevent its being washed away. Accordingly, the most advantageous mode of using nitrate is to apply it as a top-dressing.

66. Nitrate, when used as a top-dressing for cereals, should be applied when the braird is an inch or two above ground, viz., about three or four weeks after sowing. When applied later than that, it causes the crop to grow too much to straw, and it retards the time of ripening.

67. Nitrate, when applied liberally to grass, increases the growth of the grasses proper, but diminishes the amount of clover and other leguminous plants; therefore, when a good crop of clover is desired, nitrate should be used very sparingly.

Sulphate of Ammonia.

68. When equal amounts of nitrogen were applied over a rotation in the form of nitrate of soda, and of sulphate of ammonia, it was found that the former was on the whole the more productive manure; but these two manures, although closely allied in some respects, have each its special use, and they should not be used indifferently.

69. Sulphate of ammonia is a less active manure than nitrate of soda, presumably for the reason that it has to be converted into nitrate before it is available for the use of the plant. The relative utility of these two forms of manure may be best understood by keeping that idea clearly in view.

70. When nitrogen is wanted for the immediate nourishment of the plant, the nitrate is to be preferred; when a less immediate and more prolonged action is wanted, the sulphate is to be preferred;

when both an immediate and a prolonged action are wanted, a judicious mixture would seem desirable.

71. For crops whose growth is rapid, and whose duration is short, the nitrate is on the whole preferable, therefore, it is very useful for cereals sown in spring; but when the crop has a long period of growth, as in the case of root crops, the sulphate of ammonia exercises a manurial influence long after the nitrate has disappeared.

72. Sulphate of ammonia should, therefore, be applied with the seed of cereals rather than as a top-dressing.

73. When sulphate of ammonia is applied as a top-dressing, it causes an aftergrowth, which may seriously retard the time of ripening.

74. Sulphate of ammonia is more firmly retained by the soil than nitrate of soda, so that, unlike nitrate of soda, it can not be entirely washed out by rain. It is, therefore, more suitable for a wet district or a wet season than nitrate of soda.

75. On the other hand, sulphate of ammonia is not so well suited for application to rapidly-growing crops in dry districts, or in a season of drought.

76. During a dry season, nitrate of soda, being immediately available if applied with the seed, may save the crop by forcing the young plant at once, and enabling its roots to get hold of moisture in the lower soil and subsoil before the drought has become severe.

77. Sulphate of ammonia can do little for the germinating seed in dry weather, as it is not in an immediately available form; and, even after rain comes, it is some time before the sulphate of ammonia comes into play, so that the result is a diminished crop, or, perhaps, a failure.

78. Sulphate of ammonia is more suitable than nitrate of soda for mixing with superphosphate, and dissolved manures generally, as it is not decomposed thereby. It does not attract moisture so as to render the manure unfit for sowing.

79. Sulphate of ammonia has been found to check the growth of clover more effectively than nitrate of soda, if applied in excess, but in moderate quantity it is an excellent manure for old grass. It is not so suitable for application to leguminous crops which are intolerant of strong nitrogenous manures, especially after the first period of their growth.

Insoluble Nitrogenous Manures.

80. Insoluble nitrogenous manures are substances containing albuminoid matter. They are very suitable for wet districts, but none of them can be considered a manure until it is finely ground, rotted, or dissolved.

81. Dried blood and meat meal are supplied in a powdery condition, and are easily rotted in the soil. They are too slowly acting manures for cereal crops usually, but when applied to root crops they decompose in time to yield nitrogen to the plant during the latter part of the growing season.

82. They form excellent ingredients in the composition of a turnip manure, and that is their proper use when in an undissolved condition.

83. Horn dust is of various kinds. The only kind that has been successful is a fine sawdust, which is to be had only in small quantity. In that form it is a nitrogenous manure of the highest quality, capable of being used either for cereals or for root crops.

84. Keronikon is a powdery kind of horn material, somewhat less valuable than dried blood or meat meal for direct application as a manure.

85. Other kinds of horn shavings and horny material coarsely ground are not fit for application; and shoddy as usually supplied, has been found useless.

86. All these nitrogenous matters, when dissolved in sulphuric acid along with phosphates, make manures whose nitrogen is rapidly available for the use of plants. They form the nitrogenous part of what is sold under the name of "dissolved bones," and are as active nitrogenous manures as the gelatine contained in bones which have been dissolved.

87. It seems to be with nitrogenous manures as it is with phosphates, they are nearly all good alike when they are dissolved. When they are reduced to an exceedingly fine powder, they are also very good manures, especially in moist land, but they are of little use when undissolved and only coarsely ground.

88. Rape cake dust and cotton cake dust decompose slowly in the soil, especially the latter, and that is probably due to the large amount of oil they contain. Rape cake has proved the better manure of the two.

89. The large amount of organic matter contained in these manures has in the long run a very beneficial influence on the soil, rendering it less liable to injury from drought.

Concerning Potash Manures.

90. On an average of seasons and crops, the sulphate of potash has produced a slightly better result than the muriate.

91. Muriate was a little later in coming into operation than sulphate, but the crop gained ground at a later stage of its growth.

92. When applied to cereals, the straw grown with muriate was lighter, longer and tenderer than that grown with the sulphate.

93. When top-dressed with nitrate of soda, the crop with muriate came away more rapidly than that with sulphate.

94. Early application of muriate of potash has not been so successful as the early application of sulphate of potash, but probably if spread in autumn it would have been more successful.

95. Potash manures are wanted by all crops to some extent, but mostly by leguminous crops.

96. Potash affects the grain of crops far more than the stem and leaf.

97. Potash manures do not much increase the amount of straw in cereals, but they toughen the straw and render it less liable to be lodged.

98. The leaf and straw of crops contain much potash, but these are not much increased in bulk by its application in the manure.

99. Potash manures applied to a turnip crop may increase the crop, but they frequently diminish it considerably.

100. When dung is used for the turnip break, there is no need of potash in the manure.

101. When dung is applied in the drills for the turnip crop, the application of potash usually diminishes the crop.

102. When no dung is used for the turnip crop, potash given in the manure usually increases the crop.

103. The object in view in applying potash manure to the turnip break on dunged land may be to benefit the succeeding white crop, and also the grass which follows, but in that case it would be better to withhold the potash manure from the turnip crop and apply it directly to the white crop and seeds. This practice would serve to strengthen the straw of the white crop, and to increase the clover in the succeeding grass crop.

104. It has been affirmed that the depressing effect of potash manures on the turnip crop may be avoided by applying them early. That has been found to be the case with sulphate of potash, but not with the muriate, when applied only three months before sowing.

*Concerning Guanos.**

105. Guanos are not complete manures, and their sole application produces results which are disappointing.

106. The chief defect of guanos is their want of potash.

107. Peruvian guano, which contains more potash than the others, was the most successful at the stations.

108. Peruvian guano, as now imported, contains very little soluble phosphate and nitrogenous matter, and is improved by being dissolved.

109. Peruvian guano produced better results with cereals than with root crops.

110. Ichaboe guano is less adapted for sole application than Peruvian guano, and is not suitable for dissolving.

111. Fish guano, as at first supplied, contained about ten per cent of oil, and was less effective than Peruvian and Ichaboe; but recently the oil has been in great measure extracted, with the result of greatly improving the manure.

112. Fish guano contains a large amount of organic matter, and its continued application improves the condition of the land, rendering it more capable of withstanding drought, and the crops grown on it less liable to disease.

113. Guanos are better suited for forming part of mixed manures than for sole application.

Concerning Quantity of Manure.

114. In order that light manures may be used most profitably, they must be applied in sufficient quantity to produce a full crop. The application of light manures may be underdone as well as overdone. To underdo it is to incur expense without adequate remuneration, and to overdo it is to waste manure, and run the risk of injuring the crop.

115. In every soil and system of manuring there is a point beyond which it is unprofitable to go in the application of manure, and that is a point short of which it is unprofitable to stop. What that point is every farmer must discover for himself.

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*Since the experiments began, the supply of Peruvian guano, containing ten per cent or upwards of nitrogen, has ceased, and the supplies now imported contain half as much nitrogen, but with a corresponding increase of phosphates. The supplies of Ichaboe guano of that character are now very limited. The supplies of first manure of that character are on the increase, and are improving in quality.

116. The quantities of manure used at the stations were so arranged that each plot, when under root crop, received at the rate of one hundred and sixty pounds of phosphoric acid, one hundred and twenty pounds of potash, and eighty pounds of nitrogen per acre. When a third less was used the crop was least remunerative; when a third more was used, the crop was most remunerative; but it was evident that any further increase of manure would not have been attended with corresponding advantage in the increase of crop. The proportions of manure and the amount of crop per acre were as follows, when applied for turnips:

Quantity of manure.	Crop per acre.
Nothing	8 tons.
⅓ below normal	8 tons 15 cwt.
Normal	15 tons 8 cwt.
⅓ above normal	20 tons 13 cwt.

Concerning Turnip Manures.

117. The manurial constituents of greatest importance in raising a crop of turnips are phosphoric acid and nitrogen.

118. The form of phosphate which is most reliable, and in the great majority of cases most successful, is superphosphate.

119. Ground phosphates of all kinds (if in combination with lime, or other harmless base) may be successfully employed as part of a turnip manure under favorable conditions already referred to, viz.: in the first place, fineness of grinding, a condition which can not be overdone or overrated; in the second place, softness of material, and a soil rich in organic matter.

120. Superphosphate should be spread broadcast, and may be advantageously applied to the land some months before sowing. Ground phosphates may be put in the drills near to the seed.

121. Phosphate alone may be a sufficient manure for turnips on good land, especially in wet seasons, but in ordinary circumstances some nitrogenous manure should be applied along with it.

122. For forcing away the braird, especially during dry seasons, when there is risk of the attack of turnip fly, some quick-acting nitrogenous manure—such as nitrate of soda—should be applied in the drills; but the bulk of the nitrogenous manure should be of a less active kind, such as sulphate of ammonia, or very finely-ground (or dissolved) blood, meat meal, or similar nitrogenous manure.

123. Insoluble nitrogenous manures, unless very finely ground, do not become available in time for the wants of the turnip crop.

124. Finely-ground bone meal is an excellent manure for turnips, especially on light soils in wet districts; but it requires the addition of some nitrate of soda to assist the braird. The nitrogen in the bones comes into operation at a later period of growth.

125. Pure dissolved bones has this advantage over bone meal, that it contains nitrogen in a soluble, and also in an insoluble form, so that it supplies the wants of the turnip at all periods of its growth; but it has usually the disadvantage of containing lumps of undissolved bone that are unavailable for the turnip crop.

126. Ordinarily, so-called, dissolved bones, if composed of phosphatic or nitrogenous matter thoroughly dissolved, and in a fine powdery condition, form excellent turnip manures, and may be used with great advantage, if they can only be bought cheaply enough.

127. When a turnip manure is applied along with dung it should have no potash in it; the dung contains enough of potash, and its further addition, along with the light manure, diminishes the turnip crop.

128. When turnips are grown without dung, the manure ought to contain some potash, but the fact that the ash of turnips consists largely of potash is no indication that the constituent should form an important ingredient in a turnip manure.

129. The relative importance to the turnip crop, at Pumpherston, of the three manurial ingredients, are seen by comparing plots manured as under during four years:

No. of plat.	Roots per acre. Tons.	Cwt.
22. Potash	6	14
12. Phosphate (bone ash)	9	2
18. Nitrate	13	8
11. Potash and nitrate	8	2
21. Phosphate and nitrate	14	10
1. Phosphate, nitrate and potash	16	4

Effects of Manures on the Turnip Crop.

130. The chief effect of manuring on turnips is to increase the quantity per acre, but the quality of the turnip is also much affected by the nature of the manure.

131. Soluble phosphates usually, though not always, yield a larger crop of turnips than undissolved phosphates, as they have hitherto

been, and as they usually are supplied. The advantages in favor of superphosphate over ground phosphate are the certainty and the rapidity of its action.

132. Ground phosphates have frequently failed to raise a good crop, and in some instances have been an utter failure, while superphosphate has always raised a good crop. The rapidity with which the superphosphate comes into operation brings the turnips sooner to the hoe, and causes the tops to meet sooner in the drills, and these are characteristics of great importance during dry and backward seasons.

133. Turnips manured with dissolved phosphate contains a higher percentage of ash than those manured with ground phosphates; therefore the dung obtained by the consumption of the former is richer in manurial constituents, notably in phosphoric acid.

134. Turnips manured with soluble phosphate, when sold off the land, exhaust the soil more than those manured with ground phosphate; on the other hand, if eaten on the farm, they will cause a more efficient distribution of manure.

135. Turnips manured with dissolved phosphate contain a somewhat smaller proportion of albumen than those manured with ground phosphates, and upon the whole they have a lower ratio of albumen to carbohydrates, which means that they have not quite so high a feeding value.

136. The diminished percentage of albumen produced by the use of dissolved phosphate has been counterbalanced by the increase in the total crop, so that the total amount of albumen per acre has been somewhat in favor of the crop grown with soluble phosphate.

137. Dissolved phosphates, when applied in April, have produced a better crop of turnips than when applied with the seed in June, The earlier manured turnips were denser and produced more solid food per acre than the others.

138. Turnips manured early had more ash than those manured with the seed.

139. When turnips are manured early the nitrogenous part of the manure should be of a slow-acting kind, such as that contained in bones. Quick-acting nitrogenous manures should be applied either with the seed or as a top dressing.

140. A deficiency of nitrogenous manure prevents the crop from making use of the phosphates in the soil, unless the soil is in high condition; it retards the brairding of the plant and renders it

more liable to injury from drought; it diminishes the amount of tops and, consequently, of bulbs; hastens the time of ripening and shortens the period of growth.

141. When the nitrogenous manure of turnips is given entirely in the form of nitrate of soda, or of sulphate of ammonia, the latter has been found to produce a denser, sounder turnip.

142. The best way of applying potash to turnips is to apply it several months before sowing.

143. Potash manures cause an increase in the amount of turnip tops but retard the ripening of the bulbs.

144. An excess of potash manures decreases very materially the quantity of roots and may greatly injure the crop.

145. It is scarcely possible to overdo the application of phosphates to turnips so far as the health and feeding quality of the roots are concerned; but too liberal an application of nitrogenous manure unduly increases the tops and retards the ripening of the bulbs, and also increases their liability to disease.

General Observations on Turnips.

146. Turnips contain a smaller percentage of solids than Swedes. The turnips at the stations contained from seven to nine per cent solids, and the Swedes from ten to twelve per cent.

147. The solid matter of the Swedes contained fifteen per cent more albuminoids than that of the turnip, and there was as much nourishment in ten tons of Swedes as in thirteen tons of turnips.

148. Turnips contained in their dry matter nearly eight per cent of ash, and Swedes only about five and one-half per cent. The latter were, therefore, less exhausting to the land.

149. Large turnips are not so economical as medium-sized ones, in any way.

150. They contain more water, and produce less solid matter per acre.

151. The larger they are, the smaller is the proportion of true albumen in their solid matter; they are the less mature and the less nutritious.

152. They contain a higher percentage of ash, and are, therefore, more exhausting to the soil.

153. They have a low specific gravity, and are usually spongy in the heart.

154. They are more liable to rot, and do not keep so well when pitted.

155. Turnips, at their best, are too watery a diet, and the larger they are, the poorer the diet.

156. Small turnips, on the other hand, are not so profitable as medium ones, because they do not produce so much solid food per acre, and although they contain a higher percentage of solids and a smaller percentage of ash, yet their solid matter consists largely of indigestible woody fiber, and is, therefore, less nutritious.

157. The best turnip seed is that which has the highest specific gravity.

158. The better the seed, the thinner it should be sown. Thick sowing of good seed is very detrimental to the progress of the young plant, for as nearly every seed germinates, the competition among the young plants for the food contained in the soil is so great as to prevent any from obtaining its due amount of nourishment and sufficiently establishing its roots, so that the young plants receive a severe check at the time of thinning.

159. The quality of the seed has a far more powerful effect upon the composition and nutritive qualities of the bulbs than the kind of manure, so that neighboring bulbs may differ enormously in their vigor and feeding quality.

160. By means of a careful selection of bulbs for seeding, it is possible to increase the albuminoid matter in the turnips. Whether the seed thus selected will produce a correspondingly improved feeding turnip, and be as reliable a crop, have yet to be determined.

161. The nitrogenous matter in turnips is partly of a nutritive, and partly of a non-nutritive kind. The former consists of albuminoid matter. The ratio of nutritive to non-nutritive nitrogenous matter varies extraordinarily in different turnips, and under different circumstances of weather and manuring.

162. Bulbs grown very rapidly, whether from excess of moisture or too liberal application of soluble nitrogenous manure, have a smaller proportion of their nitrogenous matter in the form of albumen.

163. Manures which unduly force the growth of turnips may increase the quantity of the crop; but the increase of quantity is got at the expense of quality, and the deterioration of quality is mainly expressed in the large percentage of water and the small percentage of true albuminoid matter in the bulbs.

164. In order to grow a large, and at the same time a healthy and nutritious crop of turnips, such a system of manuring, or

treatment of the soil, by feeding or otherwise, should be practiced as will result in the general enriching and raising of the condition of the land, so that the crop may grow naturally and gradually to maturity.

165. For that purpose a larger application of slowly-acting manures, of which bone meal may be taken as the type, is much better suited than smaller applications of the more quickly-acting kind.

166. A certain amount of quickly-acting manure is very beneficial to the crop, especially in its youth; but the great bulk of the nourishment which the crop requires should be of the slow-rotting or dissolving kind, as uniformly distributed through the soil as possible.

Effects of Manures on the Barley Crop.

167. Manures applied to the barley crop affect, in the first place, the quantity per acre, both in grain and straw; in the second place, and to a much less extent, they affect the quality of both grain and straw, and they materially affect the time of ripening.

168. The most important constituent of a manure for the barley crop is nitrogen. In ordinary circumstances it is the quantity of nitrogen in the manure or in the soil which determines the bulk of the crop.

169. The relative importance to the barley crop of the three manurial ingredients may be seen from a comparison of the results obtained on the plats manured as under for five years:

No. of plat.	Grain per acre, lbs.
22. Potash	875
12. Phosphate (bone ash)	1,175
17. Phosphate and potash	1,256
18. Nitrate	1,287
21. Nitrate and phosphate	1,706
11. Nitrate and potash	1,814
13. Nitrate, potash and phosphate	2,596

170. In an ordinary rotation of cropping, in which barley succeeds turnips, the phosphate and potash required by the crop are relatively abundant in the soil, and a good crop can be obtained if only some nitrogenous manure is applied in sufficient quantity to enable the plant to take up its mineral food.

171. Sulphate of ammonia has been a better manure for barley than nitrate of soda. It should be applied with the seed, and not as a top-dressing.

172. Nitrate of soda is most profitably applied as a top-dressing to the young braird.

173. The kinds of nitrogenous manure most suitable for barley are those which are soluble and rapid in their action, such as sulphate of ammonia and nitrate of soda.

174. Sulphate of ammonia, if applied as a top-dressing, and nitrate of soda, if so applied much later than three weeks after the date of sowing, may increase the quantity of the crop both in grain and straw, but the quality of the grain, as indicated by the weight per bushel, will be lowered, and the time of ripening will be retarded.

175. A difference of three weeks in the time of ripening occurred among the experimental crops; the earliest were those which were manured with soluble phosphate, and whose nitrogenous manure was nitrate of soda applied with the seed; the latest were those which received no nitrogenous manure, an overdose of it, or too late a top-dressing,

176. The effect of soluble nitrogenous manure is chiefly visible in the increase of straw. An overdose of nitrate of soda or sulphate of ammonia causes the crop to run to straw; the straw is weak and liable to lodge, and the grain is not only correspondingly diminished, but a large proportion of it is light grain.

177. Nitrate of soda increases the straw more than sulphate of ammonia, for the reason that the straw has a short period of growth, and therefore the advantage rests with the more active manure.

178. Slowly acting nitrogenous manures are of no use to the barley crop, unless applied some months before the time of sowing.

179. Phosphatic manures are next in order of importance for barley. The more speedy their action the better, therefore superphosphate is the most reliable form of phosphate.

180. The plats to which soluble phosphates were applied came to maturity ten days before those with insoluble phosphates.

181. Superphosphate gave a heavier crop usually; it increased the yield of grain more than that of the straw, and it produced a straw of a lighter and more elastic kind.

182. The application of phosphatic manures does not much affect the quantity of the straw, and that is the more remarkable as the

straw of cereals is comparable with the bulbs of the turnip crop. A good crop of turnips may be followed by a good crop of straw, but not necessarily by a good crop of grain.

183. Potash manures have a beneficial effect on the barley crop—they strengthen the straw and diminish the liability to lodge. The sulphate of potash made a short, stout straw, and increased the weight of the crop both in straw and grain.

184. Muriate of potash made a longer, lighter and more handsome straw, and its beneficial effect was most marked on barley, to which nitrate of soda had been applied as a top-dressing.

185. A deficiency in the amount of nitrogenous manure applied to barley not only diminished the total amount of the crop, but it also diminished the percentage of albuminoid matter contained in the grain.

186. Barley, top-dressed with nitrate of soda, contained somewhat more albuminoid matter than that which had the nitrate applied with the seed.

187. The amount of albuminoid matter varied from eight and one-half to eleven and one-half per cent. The former amount was contained in barley from whose manure all nitrogenous matter was withheld, and the latter from barley top-dressed with nitrate.

188. The starch and sugar contained in barley constitute the great bulk of its organic matter (about sixty-eight per cent). They are not much influenced in relative amount by the action of manures. They are more under the influence of sunshine and season.

189. Well-ripened grain, with a high weight per bushel, makes the best barley seed, producing a crop much more abundant and weighing more per bushel than that grown from light seed.

The Effects of Manures upon the Oat Crop.

190. In so far as the oat crop is a cereal crop, its manurial requirements resemble in the main those of the barley crop.

191. The chief points noticed in comparing the two crops are that the oat crop does not root so strongly as barley; it makes a feebler start than barley, and is more dependent upon moisture.

192. It is, therefore, more liable to disease or injury in its youth, especially during dry seasons.

193. It is more suitable for wet districts and for growing on soils that retain moisture, and notably on soils rich in organic matter.

194. When grown after grass the organic matter left by the roots of the grass is improving to the land and favorable to the oat crop.

195. When lea is ploughed up in autumn and exposed to a dry winter and spring, the openness of the land favors the rapid destruction of organic matter, and enables the drought to be detrimental to the crop.

196. The manures required for oats are quick-acting manures, to enable the crop to get a good hold of the soil before the nourishment contained in the seed is exhausted.

197. For this purpose superphosphate and nitrate of soda are peculiarly applicable.

198. During the very dry spring of 1885, the oat crop at the stations, and in the Lothians generally, was much injured by drought, and what is called "segging" or "tulip root" was very prevalent, so that the produce in some districts was not one-third of an average crop.

199. The plats that did best at Pumpherston, and were least diseased, were those which had for years been manured with substances rich in organic matter, and those which had dissolved phosphate and nitrate of soda applied to them.

200. The plat manured with fish guano and that manured with rape dust, both of which are very rich in organic matter, were entirely free from disease. Those manured with insoluble phosphates and slowly-acting nitrogenous manures, were very much diseased.

201. Sulphate of ammonia, although a soluble manure, did not come into operation in time for the wants of the young plant during the dry season, and the crop that received that manure was a signal failure at both stations.

202. Potash manures, especially muriate of potash, had a very beneficial effect upon the oat crop, and considerably increased the yield of grain, and, in a less degree, the amount of straw.

203. The general conclusions to be drawn from the experiments with the oat crop are that the treatment of the land should be such as to accumulate organic matter in it, to prevent too great a loss of moisture, and to provide the young plant with manures that come rapidly into operation.

204. When the young plant has safely passed the critical period of its growth, it roots deeply and lays hold of the moisture and nourishment contained in the subsoil.

The hay crop at the stations was grown without manure, and the different amount of produce on the different plats was due to the residual fertility derived from the manures applied to the preceding crops. The results obtained are held over to be considered along with those of the experiments now in progress, whose object is to determine the relative amount of unexhausted fertility left by the various forms of manure employed in the experiments.

The Effects of Manures upon the Bean Crop.

205. The usual practice in bean-growing districts is to apply dung to the bean break, and the opinion prevails that beans can not be successfully grown without dung, but the experiments at Pumpherston station show that a full crop of beans may be grown with artificial manures upon land that has not been dunged for ten years.

206. The relative importance to the bean crop of the three chief constituents of a manure may be seen at a glance on comparing the produce of eight plats manured as follows for six years:

No. of plat.	Kind of manure.	Bushels dressed grain per acre.
27.	No manure	2 1-2
12.	Phosphate (bone ash)	5 1-6
18.	Nitrate	6 1-4
21.	Phosphate and nitrate	5 1-3
22.	Potash	26 1-2
17.	Potash and phosphate	42 1-3
10.	Potash, phosphate and nitrate	45 1-2
38.	Potash, phosphate, nitrate and gypsum	51

207. The characteristic ingredient of a bean manure is potash.

208. Without potash in the manure, the other two ingredients are of very little use, unless, indeed, the land be very rich in potash.

209. Potash salts alone may be a sufficient manure on land in good condition, and may even produce a fair crop on land that is in poor condition.

210. Phosphate, when applied along with potash salts, or when applied to land rich in potash, has a marked effect upon the crop.

211. Nitrogenous manures, even when of the most favorable kind, have very little influence in increasing the bean crop.

212. Lime in the form of gypsum, or sulphate of lime, has a beneficial effect upon the crop.

213. Dissolved phosphate acts far more powerfully on the bean crop than ordinary ground phosphate.

214. Phosphatic guano was more effective than ground mineral phosphate, presumably for the reason that a small proportion of it was in an easily dissolved form.

215. The nitrogenous manures that are most beneficial to the bean crop are those whose action is rapid and soon over. In this respect, nitrates are preferable to all other nitrogenous manures.

216. Nitrogenous manures should either be applied in very small quantity, or altogether withheld from the bean crop.

217. Nitrogenous manures that come into operation after the crop has made some growth, have an injurious effect. Even sulphate of ammonia is too slow in its action, and retards the growth of the crop.

218. Nitrogenous manures should not be applied as a top-dressing to the bean crop.

219. Peruvian and other nitrogenous guanos are among the worst manures for the bean crop. They contain too much nitrogen, and too little potash.

220. The muriate of potash has proved a more effective manure than the sulphate.

221. The beneficial effect of gypsum is to be ascribed, not to the sulphuric acid it contains, but to the lime, which, in combination with sulphuric acid, is a soluble manure.

222. The general results of the experiments with different manures on the bean crop inform us that the bases potash and lime are the substances most required by the crop. The acids, phosphoric acid and nitric acid, are of secondary importance, and sulphuric acid is of no importance.

223. A legitimate inference to draw from the experiments with beans at Pumpherston is, that farm-yard manure is beneficial to the bean crop chiefly on account of the potash it contains.

The dry matter of ordinary dung contains about two per cent of potash, one per cent phosphoric acid, and fully two per cent of nitrogen. The potash and phosphoric acid are, therefore, present in the proportions that may be considered favorable for the nourishment of the bean crop; but the nitrogen, which is the most valuable constituent in dung, is there in enormous excess.

Only about a sixth part of the nitrogen in dung is present in the soluble form ready to nourish the young plant, while about five-

sixths is there in a slowly-acting albuminoid form, which in a great measure comes into operation at a late period of the plant's growth, and tends to retard rather than to advance the crop.

The application of dung to the bean break, can not, therefore, be considered an economical practice, for, in supplying the crop with the potash which it requires, and with phosphates which are beneficial to it, it supplies at the same time a large amount of nitrogenous matter which the crop does not require, and may be the worse for, and this excessive application of nitrogenous matter involves a loss of nitrogen during the long fallow that intervenes between the spreading of the dung and the growth of the succeeding cereal crop, for whose nourishment nitrogenous matter of a soluble kind is of primary importance.

224. For land dunged in autumn—or for land in good condition—it would seem from the experiments at Pumpherston that the application of superphosphate, muriate of potash, and sulphate of lime, in equal parts, would be a very appropriate manure for the bean crop.

225. The composition of beans is very uniform whatever be the nature of the manures applied. It is the quantity of the crop, and not the quality of it, that is affected by the application of manures.

Retrospect.

226. A review of the manurial requirements of a rotation of crops, consisting of turnips, barley, beans and oats, shows that while the three great constituents of a manure—nitrogen, phosphoric acid and potash—are all required in order to raise full crops, and to maintain the fertility of the soil, the predominance which should be given to one or other of these constituents varies with the crop. For turnips, the predominant constituent is phosphoric acid, for barley and oats it is nitrogen, and for beans it is potash.

227. The relative importance of the three constituents for these three classes of crops must be arranged in the following manner:

	TURNIPS.	CEREALS.	BEANS.
First.	Phosphoric acid.	Nitrogen.	Potash.
Second.	Nitrogen.	Phosphoric acid.	Phosphoric acid.
Third.	(Potash.)	Potash.	(Nitrogen.)

The constituents inclosed in brackets should not be applied to the crops to which they refer, unless it has been proved by experiment that the land is deficient in them, and that the crops are

benefited by them, for it may happen that they have an injurious, instead of a beneficial, effect.

Regarding the forms in which the three constituents should be applied, reference must be made to the information given under each heading in the previous pages of this report, but it may be shortly noted that—

228. For turnips, the phosphates should be applied either in a soluble form or in a state of very fine division. In the case of ground phosphates, they should be at least so finely ground as to pass through a sieve of 120 wires to the linear inch, or they should be of a kind that rapidly rot in the soil (such as bone meal), and at the same time so finely ground as to permit of their being rotted in great measure during the period of the crop's growth. The nitrogenous manure should be partly of a quick-acting, and partly of a slow-acting kind, so as to be of service to the crop during the whole period of its growth.

229. For cereals the nitrogenous manure should be very rapid in its action so as not to retard the ripening of the crop; and if applied as a top-dressing, it should consist of nitrate. The phosphate can not be too rapid, and on that account, superphosphate is to be preferred to any other form of phosphate.

230. The importance of potash in a cereal manure, will depend on whether seeds are sown with the crop. If that is the case, potash salts take the second place, as the presence of potash in the manure is of importance for the nourishment of clover.

231. For the bean crop, the form of potash salt that is most suitable is the muriate of potash, and superphosphate is preferable to other forms of phosphate, probably on account of the large amount of sulphate of lime contained in that manure; but if sulphate of lime is applied to the crop, any other good phosphatic manure may form part of the mixture. The only kind of nitrogenous manure that is to be recommended for that crop is a soluble one, and that in small quantity applied with the seed.

232. When farm-yard manure is used for the turnip crop potash salts should not be applied to it, and any nitrogenous manure added should be soluble.

The need which cereal crops have for nitrogen points strongly to the conclusion that a part of the dung should be withheld from the root crop and applied to the white crop; and this is all the more to be recommended as it is evident that a considerable loss of the

nitrogen of the dung is inevitable when a heavy dunging is applied to the fallow break.

If dung is to be used for beans it seems a legitimate inference from the experiments that it should be applied to the stubble rather than put in with the crop.

ORGANIC MATTER.

In concluding this statement I think it of the utmost importance to observe that while it has been stated that on ordinary soils the three constituents — phosphoric acid, nitrogen and potash — are sufficient to form what is known as a complete manure, and that a manure containing two of these substances, or, it may happen only one of them is a sufficient manure to apply to certain crops in certain circumstances; nevertheless it must not be supposed that, in the manipulation of these three constituents in reference to the crops they are producing, lies the whole question of manuring.

The rapidity with which light manures act upon the crops to which they are applied has tended to restrict our view too much to the two factors — manure and crop — and has caused us to think less of the soil than our forefathers did. Before the days of light manures — a time comparatively recent — when the wants of a crop for phosphates, nitrates and potash were unknown, farmers fixed their attention upon the soil, and used every means to raise its general fertility, to put it into what is called high "condition," and this they did by the use of heavy manures containing a large amount of organic matter. It has since been discovered that plants can grow to perfection without organic matter, but the circumstances in which that is possible for crops are not those which prevail in ordinary farming, and in this climate.

It is to the organic matter in the soil that are due many of the changes going on there that are beneficial to the roots of plants. The warmth and moisture of the soil are increased by the organic matter in it, and the acids formed by its decay have an important part to play in dissolving the mineral matter which forms the food of plants. It is the key to the treasures of the soil, but in the ordinary operations of agriculture, in the constant disturbing and working of the ground, organic matter is rapidly destroyed, so that if farm-yard manure and organic composts or other substances rich in organic matter, are not put into land under cultivation, or fed on it, it soon becomes unduly deprived of organic matter, and deteriorates as a medium for the growth of roots, and for the reten-

tion of moisture, and as a store of fertility gradually becoming available for the nourishment of crops.

During very dry or cold seasons, and even during very wet ones, the want of organic matter in the soil is a source of danger to the crop, and the fate of many plats at the stations during the recent drought shows how intimately the fertility of the land, and the health and safety of the crop, are concerned in the accumulation of organic matter in the soil.

However much, therefore, we may commend the application of quick-acting light manures — phospates, nitrates and potash salts — for the assistance of crops, it is quite evident that their proper position on most kinds of lands is subordinate to that of the heavier manures and to the slowly-acting manures rich in organic matter, which perform the important work of building up the fabric of the soil, and accumulating therein a reserve of fertility which is commonly known under the name of "condition," and which is also called "back-bone" by those who are able to appreciate its importance.

The results of the experiments at the society's stations, which are categorically expressed in the foregoing paper, are the outcome of a great amount of labor, care and observations, extending over eight years. To those who are acquainted with the difficulties attending the performance of accurate field experiments, and the danger and disturbances to which they are liable, it may seem too short a time to enable one to bring to a satisfactory termination an investigation which has for its object the drawing of rather fine distinctions regarding the manurial values of substances, many of which are very closely allied, and the fact that during the past eight years the carrying out of field experiments has been attended with more than usual difficulty, owing to the adverse and abnormal weather which has prevailed, will tend to strengthen that opinion.

I am well aware of the great force of that objection, and I admit that many of the unreserved statements contained in this short resume may be too dogmatic to be the outcome of so short and localized an experience; but it must be explained that the results obtained on the stations are the product of experiments conducted on a large scale, supplemented and confirmed in many cases by collateral experiments, performed under varying conditions, and that the character of the results obtained in most cases became more marked and intensified as the experiments progressed. The

annual intensifying of the result of an experiment, repeated year after year, carries conviction to the mind of an experimenter; and, when it has gone so far, it has achieved the object for which it was intended. A further continuance of the experiment may elicit nothing new, and may even have the effect of giving undue significance to results, which, in the exaggerated form in which they are presented in a long-continued experiment have no parallel in the ordinary practice of agriculture.

Farmers' Institutes.

During the winter of 1886 and 1887, there were held under the authority and at the expense of the New York State Agricultural Society, the following institutes:

Lockport, Niagara county, January thirteenth and fourteenth, 1887.

Ithaca, Tompkins county, February sixteenth, seventeenth and eighteenth.

Oswego, Oswego county, March second and third.

Batavia, Genesee county, March fifteenth and sixteenth.

Schenectady, Schenectady county, March twenty-fourth and twenty-fifth.

At each of these the programme was so made up, as to embrace the leading agricultural industries of the locality, and persons were in attendance prepared and able to instruct on those subjects the audiences gathered, and after each of these addresses an opportunity was given to ask questions, or to discuss any points made by the speaker. The following are the programmes of each as carried out, and in subsequent pages of this volume will be found a part of the papers and addresses as given and in some cases the most interesting part of the discussions which followed, all showing the deep interest taken and that much good is to come from the continuance of this work.

LOCKPORT INSTITUTE.

PROGRAMME.

THURSDAY, JANUARY 13. MORNING SESSION — 10.30 O'CLOCK.

Welcome address ..... Mayor William Spalding
Response ..... President James McCann
The Farmer's Garden,
E. S. Goff, Horticulturist of the Experiment Station, Geneva

AFTERNOON SESSION — 2 O'CLOCK.

The Farmer's Condition and How to Better it,
W. A. Armstrong, Editor *Husbandman*, Elmira
Something About Corn,
Dr. E. Lewis Sturtevant, Director New York Experiment Station

EVENING SESSION — 7 O'CLOCK.

Music ..... Compton's Orchestra
Insects, Injurious and Beneficial,
Professor A. J. Cook, Michigan Agricultural College, Lansing, Mich.
Music ..... Compton's Orchestra

FRIDAY, JANUARY 14. MORNING SESSION — 10 O'CLOCK.

Winter Butter-making..... Professor L. B. Arnold, Rochester
Farmers' Homes, and How to Protect Them,
Mrs. E. Taylor, Johnson's Creek

AFTERNOON SESSION — 2 O'CLOCK.

Pigs and Pig Growing..... F. D. Curtis, Kirby Homestead
What is Being Done to Exterminate Bogus Butter,
J. K. Brown, State Dairy Commissioner

ITHACA INSTITUTE.

PROGRAMME.

WEDNESDAY, FEBRUARY 16. AFTERNOON SESSION — 2.30 O'CLOCK.

Early Lamb Raising..... J. S. Woodward, Secretary
Sheep Industry..... James Wood, Mount Kisco
Recuperative Agriculture ..... Professor I. P. Roberts

EVENING SESSION — 8 O'CLOCK.

Address of welcome..... President C. K. Adams
Response ..... J. S. Woodward, Secretary
Address — Education of American Farmers,
Geo. W. Atherton, LL. D., President Pennsylvania Agricultural College

THURSDAY, FEBRUARY 17. MORNING SESSION — 9 O'CLOCK.

Bogus Butter..... J. K. Brown, State Dairy Commissioner
Churning,
Major H. E. Alvord, Massachusetts Agricultural College, Amherst, Mass.
Jersey Cattle ..... E. H. Libby, New York city

AFTERNOON SESSION — 2.30 O'CLOCK.

Weeds ..... Professor A. N. Prentiss, Ithaca
Agricultural Botany..... Dr. E. Lewis Sturtevant, Geneva

EVENING SESSION — 7.30 O'CLOCK.

Address — Land Tenure and Limitations to Agriculture,
Hon. Edwin Willets, Pres. Mich. Agricultural College, Lansing, Mich.

FRIDAY, FEBRUARY 18. MORNING SESSION — 9 O'CLOCK.

Limestone, Lime and Plaster..... Professor G. C. Caldwell, Ithaca
The Pig on the Farm..... F. D. Curtis, Charlton
Answers to Entomological Questions.... Professor J. H. Comstock, Ithaca

AFTERNOON SESSION — 2 O'CLOCK.

Contagious Cattle Diseases..... Dr. James Law, F. R. C. V. S.
Breeding Dairy Cattle..... E. A. Powell, Syracuse

OSWEGO INSTITUTE.

PROGRAMME.

WEDNESDAY, MARCH 2. MORNING SESSION—10.30 O'CLOCK.

Warm Barns vs. Feed..... J. S. Woodward, Secretary
Hints to Fruit Growers..... Seth Fenner, East Aurora

AFTERNOON SESSION—2 O'CLOCK.

Dangers that Threaten the Farmer's Home,
Mrs. E. Taylor, Johnson's Creek
Notions about Pigs..... Mason C. Weld, Closter, N. J.

EVENING SESSION—7 O'CLOCK.

Breeding Dairy Cattle,
Major Henry E. Alvord, Massachusetts Agricultural College
Manures, Making and Saving..... Professor I. P. Roberts
Ayrshires..... J. F. Converse, Woodville

THURSDAY, MARCH 3. MORNING SESSION—9.30 O'CLOCK.

Making and Salting Butter..... Professor L. B. Arnold, Rochester
Silage and how to Save it..... W. H. Gilbert, Richland
Silage in the Dairy..... Professor C. S. Plumb, Geneva
The Farmer..... W. A. Armstrong, Elmira

AFTERNOON SESSION—2 O'CLOCK.

A Plain Talk to Farmers..... Lieutenant-Governor E. F. Jones
Horse Breeding..... F. B. Redfield, Batavia
Holsteins..... Dudley S. Miller, Oswego

BATAVIA INSTITUTE.

PROGRAMME.

TUESDAY, MARCH 15. MORNING SESSION—10.30 O'CLOCK.

Thoroughbred Stock Raising..... E. Townsend, Pavilion
What Ails the Farmer..... Hugh T. Brooks, Pearl Creek
Depression of the Fruit Business..... P. C. Reynolds, Rochester

AFTERNOON SESSION—2 O'CLOCK.

Grains of the World..... Professor C. S. Plumb, Geneva
Insects..... Dr. J. A. Lintner, State Entomologist
Manure Without Money..... Herbert Myrick, Springfield, Mass.

EVENING SESSION—7.30 O'CLOCK.

Address of Welcome..... Judge M. H. Peck
Response..... J. S. Woodward, Secretary
Farmers' Wives..... Mrs. E. Taylor, Johnson's Creek
Address—Farmer and Finance..... Comptroller A. C. Chapin

WEDNESDAY, MARCH 16. MORNING SESSION — 9.30 O'CLOCK.

Common Sense Merinos ..... Davis Cossitt, Onondaga
Insects on Fruits, How to Kill Them... Professor J. H. Comstock, Ithaca
Manure Making and Saving ..... Professor I. P. Roberts, Ithaca

AFTERNOON SESSION — 2 O'CLOCK.

Floriculture in Ruts ..... E. A. Long, Buffalo
Need of Horticultural Education for the Young,
Charles W. Garfield, Secretary Michigan Horticultural Society, Grand Rapids, Mich.
Bogus Butter ..... Dairy Commissioner J. K. Brown

SCHENECTADY INSTITUTE.

PROGRAMME.

THURSDAY, MARCH 24. AFTERNOON SESSION — 2 O'CLOCK.

Warm Barns, Close Housing, High Feeding, the Requisites for Profitable Stock-Keeping ..... J. S. Woodward, Secretary
Potato Culture ..... Professor E. S. Goff, Geneva
The Cow and the Pig..... F. D. Curtis, Charlton

EVENING SESSION — 7.30 O'CLOCK.

Address of Welcome..... Judge J. S. Landon, Schenectady
Response..... The Secretary
Address..... Senator H. R. Low, Middletown
Experimental Farming,
Professor C. S. Plumb, Experiment Station, Geneva

FRIDAY, MARCH 25. MORNING SESSION — 9.30 O'CLOCK.

Twenty Minutes with Bugs ..... Dr. J. A. Lintner, State Entomologist
Water and Drainage..Professor M. E. Perkins, Union College, Schenectady
Hints to Farmers..... H. E. Abel, Quaker Street

AFTERNOON SESSION — 2 O'CLOCK.

Recuperative Farming ..... Professor I. P. Roberts, Ithaca
Address..... Lieutenant-Governor E. F. Jones
Rural Highways..... Jacob Clute, Schenectady

Besides the carrying out of the regular programme as above published, each session was commenced by the opening of a "Question Box," provided for the occasion, into which were dropped questions on any subject relating to agriculture, by any one so disposed. In this way, much useful information was disseminated, and that of a very practical kind and just suited to the necessities of those who asked the questions. Although several of these institutes were held during bad storms, yet each was largely attended, and by a class of very attentive listeners, who showed that they were in deep earnest in knowing more of the science of agriculture. The addresses and papers were of a very high order, and the continuance of such meetings must result in great good to the farming classes of the State.

Land Tenure and Limitations to Agriculture.

Read at Ithaca Institute,
By President EDWIN WILLETTS,
Of Michigan Agricultural College.

Agriculture deals with the products of the soil, especially with those products that in no sensible degree diminish its volume or change its form or character. The earth is a machine that no human use can destroy, or, in the grand result, materially impair. Land itself is as indestructible as gravity or electricity—all are instruments or agents for the use of man—the free gift of the Creator, and in which, primarily, every human being has a right equal to that of any other human being. Every man has a right to existence; further, society guarantees that existence, to a degree compels it. Society, by its laws, punishes murder, by its charity and love protects the helpless, and by its maxims, discourages suicide. But society never guarantees subsistence. The world owes no man a living. In compelling him to live, it primarily agrees, only, that he shall have a place to stand, a place to sleep, and a place to work. This is not a gift of society, however—his right is back of that. Land and air and water are the free gifts of the Creator, and every man has an inherent right to them all. In the necessity of the case, he must have them all. If society, by its laws, or its customs, deprives him of either, he is robbed of his rights.

Then these elements—land, air and water, are primary elements upon which agriculture is based. Hence, the human race are, primarily, farmers.

The starting-point is agriculture, and so long as a man lives, or a race exists, the substantial base of society is agriculture. Existence depends upon it; food and clothing, houses, comforts, commerce, manufactures, the cattle that range the hills—all are products, near or remote, of agriculture. The base of every gentleman is his manhood; the base of all society is the farmer who gets his products from the soil. The world can get along, in

a fashion, without princes and palaces, culture and paintings, churches and priests; but, blast the earth's products, and mankind would disappear as the morning dew-drop.

In all ages the vast majority of the people of this globe have been farmers. Agriculture being, therefore, the primary occupation of mankind, every man has a right to be a farmer, and has a right to a farm; that is, to so much land as he can occupy and successfully cultivate, without charge or toll, or rent, or purchase-price, as free as the air we breathe, and the water we drink. Without question, this is his primary right. All are gifts of nature which no man has a right to charge another man for. It follows, therefore, that land ought not to have a market-price; but it, seemingly, does, and a large portion of mankind find that the right to own a farm is practically denied to them. Some people, at this time think, unjustly, but every right has its limit, and we will, for a season, discuss this.

First limitation to agriculture, no two men can occupy at the same time, the same piece of land. Both have an equal primary right, but society steps in and says the first occupant has the higher primary right. Hence, the first limitation is in favor of the prior occupation—"possession is nine points of the law." The last comer can reasonably make no complaint. It may be his misfortune that he is a late comer, but he meets with a man with equal right to existence in possession of the necessary conditions of existence, and there is no law, human or divine, that would oust the prior occupant. What then is the resource of the late-comer?

It is either to pass on until he himself finds unoccupied land, or to buy out the possessor. This seems to be reasonable. So far no natural right has been invaded. So far it has simply been a conflict of equal primary rights, with the decision of society that one has a prior right and that one of the contestants must pass on or buy. This brings us to the

Second limitation. The late-comer is to seek a piece of unoccupied land in which no man has a prior right. Suppose he can not find it. This is a question of more difficulty. Where can he find any land unoccupied? What is occupation? What is possession? that is, a possession that shall fence out the rights of a man with equal rights, save the rights of prior possession? How much land may a man occupy to the exclusion of another man who is compelled to gather the products necessary to his existence? The

obvious answer is that no man has the right to occupy more land, more of this first gift of nature to all men, than is necessary to supply his own wants. But that does not settle the matter. What are his wants? How much land is necessary to supply his wants? That depends largely upon his tastes, his physical ability, the line of labor he follows, and the number dependent upon him. Some men want a fine door-yard, with drives and shrubbery and landscape; others care nothing for them. If one lives by his flocks and herds, he will want more land than if he plows and cultivates the soil. If he is a hunter and lives by the products of the chase, he will need ten or a hundred-fold more than the herdsman. So there is and can be no rule, defining, absolutely, from the basis of want alone, the amount of land a man should occupy. The amount has been fixed, if at all, by society, according to public policy, depending largely upon the amount of land to be distributed, and the population among whom it was to be divided. As a rule, society has placed no limit. Unquestionably, it is the right of society to place a limit; but as a matter of policy it has not exercised the power, except when the public necessity demanded it. In the absence of statutes or regulations of some kind, no man can hold, by possession, more than what he has in visible use in his daily and usual labors, his possession is *possessio pedis*, the possession of the foot, what he plows or pastures or fences. The statute or patent, indeed, may give him constructive possession of more; but that is based upon the assent of society, which assent may be modified or repealed according to the public exigency in all future transactions, at least, if we recognize vested rights.

But what shall one late comer do if he finds all the lands already occupied either actually or constructively? We say, pass on to lands not so occupied. Where will he find any such? In truth, it is probable that there is hardly a spot on the globe that is free from some sort of occupation. The western continent was in possession of the Indians, who claimed the whole, and thought they needed the whole. But Caucasian society thought differently, and took what it needed according to its measure of man's need, sometimes by force, and sometimes for a price, at the end of a musket. Generally, we have gone through the form of quieting the title by treaty, and for a nominal sum; thereby recognizing the law of the right of possession. Society has always claimed that it was justified in taking possession of the continent, on the

ground that its original possessors had no right, as a million, to possess what would support one hundred millions. History shows that society has never respected to a high degree, the constructive possession of large tracts. In the contest, squatter rights, if claimed by a numerous body of men, have prevailed because there has always been an apparent injustice in a single man fencing in, as it were, so much of the free gifts of nature. So that in the end, very few of the large proprietors under grants from the sovereign, realized very much from their grants.

In 1682, William Penn, for £16,000 sterling, for purchase-price, and two beaver skins annually for royalty, took a patent for the whole of Pennsylvania. His biography presents a graphic description of the harvest of annoyances, rather than pounds sterling, he reaped from his investment, and in 1712, the whole domain was restored to England on the payment of £12,000 and a small annuity to his descendants.

"Patroon" Van Rensselaer, of New York, acquired in 1637, a tract on the Hudson river, twenty-four by forty-eight miles extent. The political history of New York is replete with the tenant troubles on this and other large grants of the same kind.

In 1670, Prince Rupert received from the King, a grant of what subsequently was "Rupert's Land," the franchise of the celebrated Hudson Bay Company, the soil in perpetuity of an empire, to-day Canada's great north-west, and for 200 years the huge monopoly held it for the beaver, and against the foot of man; but the swelling tide of the human race rolled over all barriers, and England was finally compelled to quiet the title, in the interest of the settlers, for £300,000 sterling.

Why enlarge in detail? The same inevitable conflict has come down to this day, in the strifes of Fremont with his Mariposa grant, the pending struggles between the settlers on the Des Moines river grant and all through the West on the Indian reservations and the railroad grants. All these are but the clamor of natural rights against vested rights in which, in the end, the actual occupant has generally waged a winning battle with the constructive owner, sometimes with an indemnity to vested rights and sometimes not, according to the strength politically of the ousted party.

Pardon one further illustration of the treatment of society in the aggregate in regard to vested rights in property. This time personal and not landed, the right of property of man in his fellow-

man. In the light of civilization of this nineteenth century, the asserted right is not even debatable.

But, no vested right, not that even in land, has had the universal assent of mankind to the degree that this has. From the time and long before the first inspired word of the Bible was uttered or penned, to the time when slaves were imported into the Virginia plantations there was no right of property more unquestioned, no claim more entrenched in legal bulwarks or sanctioned with a more hoary age. Occasionally, in the past, one sees a revolt or protest against this right or against this constructive right to land; agrarian and emancipation acts frequently went hand in hand, but the whole trend of history is corroborative of the assertion of the right of property in man. But the uprising of natural manhood right culminated almost in the present generation. England first felt the impulse, but so entrenched was she in her doctrines of vested rights, that she gave freedom to her slaves; but indemnity to her slaveholders, as she had indemnified her land owners, both classed in the same table of rights. When the great crisis of this country came upon us, underlying which was this question of slave property, the sense of property rights, or rather the abhorrence of the confiscation of values was so strong that even Abraham Lincoln was induced to consider the suggestion of indemnifying the slaveholders by the payment of four hundred millions of dollars. But public sentiment did not sustain the proposition and finally, the nation, in the exercise of its ultimate authority, by an amendment of the fundamental law, struck from the assessment-roll and from the auction block four thousand millions of chattel property and for fear that there might be an indemnity paid for the confiscation, this same society, in the last resort of its absolute power, deliberately, two and a half years thereafter, declared in the Constitution that "neither the United States nor any State shall assume or pay any claims for the loss or emancipation of any slave, and that all such claims shall be held illegal and void."

The United States has, by its laws, expressed the aggregate sense of society, fixing in the statutes for preëmption and homestead entry, the amount needed for a home at 160 acres. At no time has it been assumed that a man may not acquire more. For reasons that I may have time to state before I close, we, in the United States, have never set any limit to individual appropriation of land. We have set a limit to land held by corporations, the

reason for which limitation will be stated at the same time. But there is scarcely a civilized nation since the dawn of history that has not at some time in its development, sought to place a limit to land-holding. The pages of history are replete with agrarian laws from and before the time that Rome sought to limit the amount to 500 jugera, or some 300 acres, down to the land agitation now so formidable in England.

The revolution now going on in Great Britain has its point and substance right here. Large tracts of land are in the constructive possession of the lords and barons and landed aristocracy, whose legal title, in some cases, dates back to the time of William the Norman, and in others from grants made by the sovereigns, in their capacity as lords paramount. Their rights have become vested, if law and usage and force can vest any rights. The landlord is a fixture in the British constitution. Blood and land run together in families, and primogeniture seals the compact. There are two classes; I might almost say two castes—the landlord and the tenant.

There is no disguising the fact that a crisis is impending in the land tenure of the British Isles, aggravated in Ireland by the further fact that to this day the tenant class is such by subjection. Irish sentiment has been in perpetual revolt against English domination and against the claims of individual ownership of land.

Time and circumstance have not eliminated from the Irish mind the feeling that land should be owned in common, that the constructive ownership of land is in conflict with natural rights.

The one apparent modification of this sentiment is the fact that the Irish immigrant to our shores seems to take as kindly to his title, in fee simple, here as a native-born citizen. Still it is essentially true that the demand of "Ireland for the Irish," is based upon the two protests against English sovereignty and English landlordism. Just now English statesmen are becoming agrarian. The act of 1870, assuming to control the relations of landlord and tenant in setting aside a large mass of inequitable contracts between them, in compelling compensation for improvements made by the tenant even without the consent of the landlord, was subversive of the claim of the landlord that he might do as he chose with his own, a supposed vested right. The act of 1881, went further, by providing courts that should regulate rent, recognizing the fact that the tenant had rights in the land itself, as

well as the landlord; that in a sense, they are joint owners. The shibboleth of the three "F's," "Fair rents, Fixity of tenure, and Free sale," as regulated by legal enactment, is in revolt of the existing order of things, and which all far-seeing statesmen will in time respect. Gladstone's recent propositions for the nation to buy out the landlords at a compulsory sale for a compulsory price, at the end of a musket, if need be, is but another step in the revolution, tempered only by the indemnity offered.

All these instances go to demonstrate that, in the ultimate, society, when hard pressed, has always claimed the right, and asserted the power, to control the occupation, the constructive occupation of land. Very rarely, however, if ever, has it interfered, in the time of peace, with actual personal occupation, that is, the possession of what a man could himself till.

It would seem, to return to our discussion under the second limitation, a simple question to ask: "Where can the late comer find a piece of unoccupied land," in view of the fact that mankind has been "6,000 years in bringing a tenth part of the earth's surface into the sorry state of cultivation in which we find it," and in view of the fact, further, that ages on ages must pass before the myriads, who shall come, shall have exhausted the bounties which prolific nature has made attainable by intelligent cultivation. But the appeal for a farm to till is made by a member of a society which has, for reasons that have appealed to its aggregate wisdom, made laws and regulations that more fully promote the highest and best development. History shows that communism has never been the soil in which the highest culture can grow; and that the world's best thought and best work is by men who were assured by society that their fence lines shall be respected by all others. But more of this anon.

It is not, as things now stand, so bad a thing for society to say to the late comer, "pass on." The people of this world have been passing on to unoccupied, or more fertile, or more balmy fields, ever since the dawn of history, and for ages before. Our ancestors left Central Asia, the Aryan field, so long back that there is no record of their migration save in the language we can trace through the thousand dialects of the constant throng passing on. We are passing on all the time in one day. The Irish are to be found in every clime; so of every nation in the civilized world.

Some of us who are seated together to-day "passed on," came

to this then wilderness, driven say you; by the behest of society, which would not carve for you a farm out of possessions, actual or constructive, of those who came into the world a little before us. Who that is here to-day will say that, to us, the edict that we should pass on to lands not occupied by others or buy out those in possession, was frought with unmixed evil? If we had all stayed at one birth-place; if the countless throngs who have sought other climes had remained, we and they would have stagnated, whereas now we and they have had room to exert our powers; have room to breathe. So society may be right, as it usually is, in the long run; and we will try to be patient when we see one neighbor has more land than we think good for us, and we will not ask for a division just yet. It is not a matter of life and death with us, and we will console ourselves with the reflection that a majority of those who are now talking of dividing, not only never held a foot of land, but could hardly be hired to stay on a farm, and would not keep it a week if given to them with the condition of the square day's work its permanent, actual occupancy implies. But I must pass on to my

Third limitation.—That our late comer must buy if he will not pass on. This implies that there shall first be a man willing to sell and then a man able to buy. In this fleeting world there are generally, under proper inducements, enough persons willing to sell, if the terms, the price, can be agreed upon. But what shall be the price? Suppose the buyer says the price shall be small because your farm, that is the land, cost nothing; it was the gift of nature; it was mine in the first instance as much as yours. You have no more right to charge me for the land than you have for the air we breathe in common. I am willing to pay you for the trouble and expense of moving out; that is all you are entitled to. You do not own the land, though you are in possession. I am willing to pay you for your possession; that you can sell, because that is yours; but you can not sell the land, because you do not own it. You have possession of it and society will not permit me to oust you and compels me to buy, but neither you nor society has the right to make me pay you for the land itself. This is the argument in a nutshell as we hear it and read it to-day, and as it has been repeated innumerable times before.

Now, for one, I am willing to concede as true that no man in the abstract has an ownership in land, and it may be asked whether I,

therefore, subscribe to the claims of those who insist on a division without a purchase-price? Most certainly not. Where then is the fallacy? Let us see. I concede no man can own the land itself, any more than he can a pound of gravity or a sunbeam or a breath of air that comes through the tree tops. But what have I a right to own? What is ownership? Every man owns "legitimately, those things which have been created by his labor, his intelligence or his activity." What a man makes, the direct results of his own labors, are his; are his property not his possessions merely, but his very own. He did not create the land, therefore he can not, strictly speaking, own it, but it does not follow that he can justly charge only for his occupation. While he does not own the land, he has something beyond mere possession of the bare land itself, something he does own as justly as the axe he has made with his own hands; he owns the improvements. These have cost him labor, every-day work, in reclaiming the wilderness, in subduing the soil, in draining the swamps, in buildings and fences and orchards, and in making a home, is a lien upon the land, and for which he can legitimately charge the purchaser. This element of value is largely ignored by all that class of publicists who insist that society should wipe out all titles to land, and should turn the face of the earth into commons. The fact is, as a rule, in the markets of the world there is no price set on the land. Nine-tenths of the farms in the State to-day would not bring more than the improvements have cost in labor and money.

When I speak of improvements, I do not mean alone the improvements on the soil itself; but I include all these labors and moneys expended to enhance the value of the farm, what it has cost for roads, bridges, school-houses, churches and court-houses. I would include a large portion of the taxes; the time spent as a member of society in the furtherance of good order, and an accessible market; in short, I would include every thing that goes to make a home in a well-ordered and prosperous community.

If any one here to-day, came into the wilderness hundreds of miles away from market, where the sound of his axe fell noiseless in the forest, and made him a home and lives upon it now, I say to him that if he can find a man foolish enough to pay him for what that home has actually cost him in days work and money expended, let him not close his eyes in sleep before he has consummated the bargain, unless he finds a new home would cost him as

much; in such a case, he better let well enough alone. The fact is, as a rule, there is no charge for the land itself; that has no market value, and the argument of our would-be anti-land monopolist, in its last element, falls to the ground.

But there is an apparent exception to the rule, which, if we analyze it, will be found only apparent — in non-resident, wild land. That, it is said, has had no labor upon it, and yet it has a market value. But what gave it this market price? Labor, in fact. We build a railroad into the wilderness, and thereby bring the lands into market. Without the road they are valueless; but the road has cost millions of dollars, and the cost is assessed upon the land affected by it. Men now want it — some for nothing — because it is the free gift of nature; but sensible men will see that there has been labor expended, so that it is more desirable than when it or its surroundings or its approaches were in the state of nature, and are willing to pay the outlay. They will see why a farm in the vicinity of the city may be worth a thousand dollars an acre, not because the land itself is worth any more than non-resident land which may be taken under the homestead law for the living upon it, but because the aggregate cost of all the improvements of the city, with its ready market, its whirl of business, its railroads, and the thousand and one expenditures of the community have been assessed as a lien upon all the land affected by these improvements, and it is for these the charge is made, and not for the land itself.

Therefore, our late comer must pay for all the legitimate expenditures if he would buy, conceding that he has the means. Society has not robbed him of any inherent right in saying he must pass on, or buy.

So far, the distinctive right of the occupant seems clear, and the price which the buyer should pay, seems just; but there is an element in the affair, which we ought not to ignore. It is that element of increase in value of unoccupied land, caused by the improvements and expenditures of others, than the nominal owner of the land; the "unearned increment," as the political economists call it; the increase of value to the non-resident, to the speculator. His land has quadrupled in value within a decade, or less, it may be; not from any labor or expenditure of his. Is he entitled justly to this increase? It is manifest that the buyer can not ask justly for a price relieved from this increase, for the

reason that *he* has not put any labor or expenditure into it, save the small percentage, ratably, his labor has to that of the whole community. It may, for a like reason, be urged that the nominal owner, not having earned by his labor or money, any of the increase, ought not to realize from the increase; that in some way the community at large being the benefactor, so to speak, should be the beneficiary. Various plans have been suggested to equalize the benefits, but none, to my mind, feasible or without difficulties as great as the evil sought to be abated. The proposal, so strongly urged at the present time, that the community shall take charge of all the land, and operate it or parcel it out for cultivation to the highest bidder, or at a minimum rate to be fixed by public functionaries, is so fertile in jobbery and favoritism and unthrift; is so antagonistic to the general sense of civilized progress, that it is not likely to find a lodgment in the public mind.

The plan with the least objection is an equalization by taxation. Not the plan urged, in some quarters, to levy taxes on land, only; for that, in the last essence, is a tax on bread, a tax on labor as much as if it were on goods or manufactured commodities, especially, if it is conceded that the position herein taken is true that the salable price of land is what has been put into it in labor and money. But, we mean, the taxation of non-resident, unoccupied land, in greater proportion than the resident cultivated land. As things are now, the man who occupies his land and cultivates it, pays taxes not only on his land, but his improvements.

He enjoys the benefits of the general rise in land with the community, and has contributed his share of the general rise. But the non-resident has done nothing to earn this increase, and it would seem no more than fair that he should pay a special tax to compensate the community for this general increase in value. For one I shall take kindly to anything that shall, in the line of compensation to society at large, prove a disability to the speculator, that shall make him earn, so far as possible, the land with its enhanced value. This is not confiscation; it is simply value for value. Congress recognized this fact of general rise in value in the land grants to the railways in doubling the price to the alternate sections reserved to itself. It should at the same time have provided that the railroads should sell only at this double price, and thereby have taken the grants out of corporate speculation, and placed the settlers on an equality on railroad lands and public lands alike.

But, to return to this third limitation, it may be said what encouragement is it to a man to make a home that in the end is not worth the cost? Why not go into something for which you may get your money back days work for days work? Please name a line of labor that you are sure of saving even the percentage of your expenditure. You build a mill, it burns down, in any event it will rot down in a few years, and will go off in smoke or decay, to the total loss of the labor and money in it, while your farm is as sound as the everlasting hills, worth nearly as much any day at the tap of the drum as the labor in it; so much saved. You go into merchandise where four out of every five fail and wish for the lone home on the hillside farm. We might enumerate all classes and occupations; but it goes without saying, that the best percentage of saving is, in the long run, with the man who has tied his labors and activities to the land, and the man who has his foot on it, is the last man to yield possession without the cost of improvements; he will insist on our third limitation, no division without pay.

Fourth limitation. I wish to note briefly another limitation in agriculture. No man singly can occupy much land with profit to himself. As soon as he jumps his garden fence, so to speak, he must take something or somebody into partnership with him. It may be an ox, a horse, a slave, a tenant, or a so-called hired man, with whom every step he takes, every day of the week he divides his products and shares his profits. When he gathers in his harvests there is only a margin left for himself. To illustrate, it has been found from careful estimate in England, that the annual cost of a single horse, in use on the farm is forty-five pounds sterling (about $220). This, of course, includes the cost of rearing, his chances of injury and disease, the short period of his working life, his keep and care while using him, and add the further fact that a man must always be harnessed with him, so to speak, and this man costs, including board, $300 a year. The larger the farm, the more horses and men—the more partners. As a rule, the larger the farm, the smaller the percentage of profit, and while for a time the increased acreage will more than make good, under judicious management, the increased division among the partners, it will last only so long as the earth has its natural fertility, its pristine strength. The large farm, as a rule, will show constantly diminishing crops, unless these enhanced profits from increased acreage are

expended in keeping the land in heart. I give fifteen years, and no more, for the successful, profitable farming of the large farms in Dakota. Ten years has shown a very sensible depreciation. Aristotle was right when he said, over two thousand years ago, that the best manure was the farmer's foot—personal supervision, careful nursing, and generous feeding of the soil. This fact that nature has placed this productive limitation upon man, this fact that, in the long run, no man can profitably occupy much land, is one that the political economist can not ignore; and for this reason sound policy should encourage small farms. That country is the most prosperous, the most productive, that has the largest proportion of small land-holders in their own right, and the philosophical reason for it is apparent. Nature can not be cheated, and mankind, as a race, is punished for the wrong attempted.

Fifth. In conclusion, why not then by law restrict a man to his garden fence? Why permit the large farms, why allow one man to monopolize so large a share of broad acres. You will have seen that he can not monopolize them if he would, that the moment he gets beyond certain limits he has to share with someone else. He can not control this law of nature, this limitation. If he does anything at all with his acres he must divide and in the end justly, or his partners will throttle him or nature will make him land poor. In the long run, then, he makes nothing by his attempted monopoly. The evil corrects itself, and society has thought that it is better and wiser that the distribution of land and its products be left to natural and common laws rather than to statute law. Then again, while there is much wrong and injustice, it is better that man should be free to acquire, should have a scope for individual intelligence and activity without trammel. Let a man have his actual individual possession of land as well as of anything else, and it will be an inducement to exertion and thrift. Place no restriction on its sale; allow no entailment, no primogeniture in fact or in law, and though one man may, during his day, have more land than he can cultivate with the highest good of the community, more than he is strictly entitled to, the second or third generation will see it distributed. When he dies it falls from his grasp, and society gathers up the fragments. So let us hesitate about the limitation in amount of what he shall actually occupy. Give a scope to individual energy and acquisition.

But on the other hand guard carefully what is permitted to corporations, religious or secular, sole or semi-public. Corporations, as a rule, do not die; their property is entailed, is never divided. If by any chance they have possession of large tracts of land, see to it that such possession is only temporary. They are the creatures of the law; see to it that they do not become lords paramount, sovereigns beyond the control of law. Let corporations have so much land as they need, and no more, for the transaction of their lawful business; but be careful that it shall not be lawful, directly or by proxy, for a corporation, secular or religious, to rent a foot of this good earth, above ground or beneath it, in the city or the country. Corporations have no soul, and this green earth is for live men struggling for an existence. Every man, who sets his first foot on this soil, has a right to place it in the footstep of the man whom he succeeds, a footstep made vacant by death. Nature is merciless, but not always unjust. She makes room for the coming generation by the death and dissolution of the present. Human law only has been capable of creating a being that never dies, and who may be capable of usurping the rights of the race for ages to come.

Further, communism in land is only another name for a corporation, in which its members lose their individuality, dwarf their aspirations, and destroy their progress. There is a sense of manliness in the individual ownership of property. Communistic habits do not breed free men. To use the words of a recent writer on Russia, who showed clearly how the people became serfs, "had the ancient Russian villagers not been communists, they would not have become slaves; not the law, making them such, but their individual weakness, which knew not how to resist, the abuse of the law, cost them their liberty."

There is no organization more exacting, or more heartless than the State. It can, and it may, in the impulse of popular sentiment, override life and property, rights and justice. In its rights of eminent domain, it may take private property without or with compensation, as it chooses; but the State is only a part of humanity; its function is only a small portion of the activities of the people. It exists for the people; not the people for it. Its prime duty is to see that all individuals have an equal chance. Its duty is to protect property, not to create it; to facilitate production, not to produce; it is the agent of man, his trustee; it has

duties, but not affections; powers, but not principle; constitutions, but not conscience. When a free people so far forget themselves and their individuality as to remit to this being, in its corporate capacity, the avenues and resources of life, the right to own and operate its railroads, its canals, telegraph, its lands, and its waters; when this same people shall have so far degraded themselves as to demand that the State shall furnish labor, shall take charge of enterprises that the individual should feel it his privilege to undertake; when for every evil and ill to which humanity is heir, there is an appeal to this conscienceless organization to rectify it, you may be sure that, as in Russia, the men became serfs from their individual weakness; so in this time and condition, this people will lose its freedom. Give as little as possible to this irresponsible being. If, as your trustee, it holds your land, as it may in the first instance, get a deed of it as soon as you can. Above all, do not beg it to take it off your hands. You have it by a higher title than a State patent. A natural right is the primary; a legal right should be a confirmation. By an edict higher than statute law, you are commanded to cultivate the soil; not for the State, but for yourself. In this commandment is a blessing. In it is home and its sacred influences, civilized society and its ameliorations. A man's home is his castle, founded on a rock. That rock and the possibilities of its structure are yours; and, because they are yours, you will defend them against all comers, State or individual. You may not have all that you are justly entitled to; avarice and force may keep you out of your inheritance; but fight for your rights; never abdicate. There is honor in ownership of the earth; the world has always deferred to the man of broad acres. A man without the possibility of a home is an outcast.

Farmers' Wives; or, Woman's Influence.

Read at Batavia Institute,
By Mrs. EMMA TAYLOR,
Of Niagara county.

To the farmer and his wife, more than to any other, we owe our heritage of prosperity and liberty. They form the central group in the primitive American picture. This picture was preëminently pastoral in character; its skies were peaceful, its coloring quiet and subdued, and its Arcadian simplicity restful and inviting. But time, with meddling fingers, has many times retouched the canvas. It has remanded to the background the central group, by introducing and giving prominence to figures foreign to the conceptions of the artist, and marred by over-heightened color the primitive purity of the scene.

In more prosaic terms, the farm, its pursuits and its domestic life, was the basis upon which was founded the American institutions. The home was rustic and simple, its inmates industrious, hopeful and happy; abundance rewarded their labors, and prosperity was the proof of their success. But the scene changes; its quiet has been broken by the shriek of the locomotive and the hum of factories. The forests and log cabins have disappeared, the low of cattle, the tinkling of bells, and the song of the plow-boy is drowned by the rumble of machinery, and the stir and bustle of a new and busy age. Princely palaces cast into shade the rustic cottage. Costly edifices, lofty spires and glittering domes, marvels of architectural skill, bespeak another age and another people. Magnificence and poverty, have taken the place of the medium conditions of the past. The millionaire and the laborer walk in separate paths, and worship at separate altars. The money-changers have entered the temple, and preside over the deliberations of justice.

Society has been reorganized. It has adopted new standpoints of judgment, and new standards of value. Under these new conditions, the farmer and his family have lost caste and standing.

The farmer now is given a second place, and his wife is almost obscured by the fashionable woman of the period. The farmer's wife of to-day, embodies more than any other woman, the qualities that distinguished the early American matron. What a strange contrast does the modern woman of fashion, with her French toilet and manners, her vapid talk and sentimental religion present to the good sense, innate dignity and kindly grace of such women of the past, as Martha Washington and Dollie Madison. The contrast is strongly in favor of the latter, and a travesty on our boasted progressive civilization.

It is needless for me to introduce to you the farmer's wife. She is part of our history, and as familiar to you as household words. Neither is it the object of this paper to go with you to her home and follow her as she performs, with tireless patience, her daily tasks, or to initiate you into the secrets of her culinary skill. Nor do I read a homily to these faithful workers, these farmers' wives, on the necessity of keeping an even temper on all occasions, or the importance of always appearing in a clean print dress, and immaculate aprons, or wearing the pattern smile, and having ready the proverbial kiss, together with the slippers and dressing-gown for the head of the family, when he dawns on the domestic scene. All of this I shall leave to those who have charge of that department of domestic culture. My object is to determine, if possible, something of woman's true relation to, and influence on the home, and on society.

The farmer's wife; her name is a synonym of industry, economy and capacity. With her name is associated golden butter, delicious cream and all the melange that is supposed to come forth, in inviting profusion from under her manipulating hands. From early dawn till dark, and sometimes till the midnight hour, her head and hands and often times her heart is taxed, to care for and supply the ever recurring wants of her family. For them she acts in the several capacities of cook, housemaid and laundress; of wife, mother, nurse and seamstress; of hostess and neighbor, of servant and lady. She has in charge the training of her children in habits of industry, the oversight of their education and morals, and is held responsible for their proper and respectable appearance in society; standing in the shadow of her husband, she is his prompter and inspirer, and in times of depression and discouragement, his unfailing source of sympathy and consolation. For all this service, for all her

hours of trial and weary labor, what is her recompense? When the farmers' institute was held in Oswego, a query was propounded: "What share of the proceeds of the farm ought the farmer's wife to receive? Some gallant gentleman in the audience answered at once, loudly and enthusiastically "all of it." I concluded that the gentleman was either unmarried, or if married and a farmer was a long distance away from home without his wife. But what are the facts in the case with reference to her remuneration. A few figures in the rule of simple addition, and without any great tax on the science of notation, will give the amount of her compensation, the sum total in dollars and cents of the receipts of her labors. Yet small as her compensation is, and with every prospect of its becoming smaller, she has never struck for fewer hours or higher wages. She has *protested* and her protests are being felt and recorded, and her claim is on the high road to recognition.

Not only has she attended faithfully to every home duty, comparatively unremunerated, but she is the soul of every moral enterprise, and the foe of every enemy of the home. As a single instance, witness her untiring efforts against the liquor traffic, and its marvelous results. Without legal recognition, almost without compensation and resting under the curse of tradition, what is the secret of woman's dauntless courage, the mainspring of her actions and influence. Theology has volunteered to define her relative position in the scale of human relations, and man has accepted its decisions, but she is daily reversing their premises, and disproving their conclusions. The secret of woman's endurance and influence lies in her intentions, in her predominating moral and spiritual nature. The reservoir of man's power, is his intellect and superior physical force. Because of his strength of muscle and intellect man has assumed the right to become dictator. He has for the same cause, arrogated to himself the first and highest places. Self-appointed judge and legislator, he has formulated two codes, one for himself and another for woman. As adjuster of compensations, he has appropriated to himself the lions share. Man by his prowess has bridged chasms, spanned rivers and tunneled mountains. By his military skill he has conquered nations, led armies and waved battle flags. He has thrilled multitudes by his eloquence, and made heroic exits in the face of an applauding world. Standing behind him, moving the scenes, filling in the pauses, and prompting his memory, we find woman. Unseen, unappreciated

and unapplauded, she binds up his wounds, stimulates his efforts, inspires his genius, and when victory is achieved, crowns his brow with love and laurels.

The transposition of the old order of society, the reversed condition of farmers and all classes of labor, from equal opportunities and representations, to lower and more unequal conditions has turned back the tide of prosperity, and now threatens to destroy the home. These disastrous conditions fall most heavily upon woman, to whom home is a shrine, consecrated by the affection of her husband, the prattle of her children, and the farewells of her departed loved ones. The prevailing injustice and inequality has fostered hatred, and bred discontent. Society is everywhere becoming honeycombed with unrest, that precurser of revolution.

To reëstablish the old order of equity, and to turn the threatened revolution into channels of a higher evolution is the problem that is engaging the attention of thinkers and philanthropists. The horizon is being scanned for the appearance of the master mind who shall be able to bring harmony out of discord, and incite in the parties representing contending interests more cordial and fraternal relations. But never till woman is recognized as an equal will the balance be restored. As well attempt to preserve the equipoise of the universe by the centrifugal force alone. Woman is the long-sought quantity, in the world's moral, social, and political equation; the missing factor in the final solution of the problem. Man's instincts have been truer than his intellectual deductions.

Surmounting the domes of legislative halls and courts of justice throughout the land, with the balances in her outstretched hand, stands the statute of woman as the impersonation of justice. Had they put into the hand of woman the ballot as well as the balance, and given her a place within, as well as without its halls, our country might have been legislated to juster methods and happier issues. Let us turn back the page, and reread the lesson written in the volume of nature. Centripetal and centrifugal forces control an atom as well as a world. Positive and negative forces undivided and indivisable operate the universe. "Male and female created He them" is the verdict of the vegetable, floral, and animal kingdom.

Then from henceforth in the home, in society, at the polls, and in legislative halls, let man and woman, climbing to a higher level, clasping hands on an equal platform, declare, "that what God has joined together" no man or law shall put asunder.

Hints to Fruit Growers.

Delivered at Oswego Institute, 1886.
By Hon. SETH FENNER,
Of Erie county.

Mr. Chairman, Ladies and Gentlemen.— I shall confine my talk to the pear and the apple, especially the apple — the food of the million. Any individual to make a success of fruit culture must have a taste or aptitude for the business. I know it is a common expression that anybody can manage an orchard and take care of it, but I also know it is one of the gravest mistakes. If there is any one branch of farming, that needs care and brain work, it is to care for fruits successfully.

In selecting ground for an orchard — I speak now of Western New York, and especially the county of Erie — select an undulating or rolling piece of ground. Select a clay loam and let the clay predominate. Select soil that is underdrained, naturally or artificially. The apple or pear tree is very like one of the human family, they don't like wet feet. After you have selected the kind of soil indicated then you want it in a proper state of fertility; if not naturally, make it so by barn-yard manures or commercial fertilizers. The state of fertility necessary is about what is sufficient to get a good crop of potatoes or corn. After you have done this, the next thing in order is to prepare the soil for the reception of your trees. Plow not less than seven inches deep and pulverize the top not less than four inches deep, make it a complete garden, as it were; you then have the soil adequate to the wants of a growing young tree. Mark out your land not less than two rods apart each way. Some prefer a greater distance and perhaps it is best, but not less than two rods will do. Go to the nursery and select your trees, and the nearer you find that nursery to where you want to set the trees the better; such trees have got accustomed to the climate and the soil and you do not incur much risk in the change. Select two or three-year-old

trees, vigorous trees; I prefer three years old. Take them up, remove all mutilated roots and carry them to the place where you want to set them out. You can facilitate greatly the planting of trees by using a plow, turning two furrows so as to leave a dead furrow each way the proper distance, and set the trees where the furrows cross. While setting be sure to take pains, and have fine, pulverized earth come in contact with every one of those fibrous roots, then the tree is ready for business at once. Set the tree about the same depth as it was in the nursery.

The one great mistake of American orchards is the multiplicity of varieties. Multiplicity of varieties work as great damage to orchards as polygamy does to the Mormons, and you want to avoid it. Select a few standard varieties, especially for market. For summer selling, select the Red Astrakan, and for fall, the Gravenstein and some Fall Pippins. For winter apples, Baldwin, Greening, Hubbardson's None-such, Tompkins County King, Russett and Cooper's Market. So much for the varieties of apples. After you have set those trees, keep them in good cultivation at least six or eight years. What I mean by cultivation, is to keep them thoroughly free from weeds and grass. In the meantime keep your soil enriched; don't allow it to degenerate. Follow some rotation of crops. If you want to use any sowed crops in your orchard, use peas and buckwheat; or if hoed crops, use potatoes or beans. Those four are the best crops to be used in an apple orchard while under cultivation. The next thing is the trimming of the trees. You know it is said, "As the twig is bent, the tree is inclined." If you commence taking care of an orchard, you can trim with a jack-knife, and will not have to use a saw. Prune at any time, or, as the Dutch say, "Prune when your knife is sharp." Any time, but be sure and prune. If you can select your own time, the best for pruning is the month of June. If not, prune at any time in the year.

In picking the fruit, I have adopted this mode: In an orchard of fifty acres, I have men and women go over and pick the fruit, and pile it in heaps. Then I go in with barrels right after the pickers, and barrel them. The less you can handle fruit, the better it is for the keeping qualities of that fruit. The only advantage gained by piling in heaps and carting to the barn, is this: If an apple is bruised or disfigured, a few days will disclose the bruise; that is all. I have tried both ways, and I say to you, from my

experience, barrel your fruit as you pick it, and head it up. Some say the apple will sweat. So it will; every time the apple is colder than the surrounding atmosphere, it will continue to sweat. In barreling apples great pains should be taken. One of the great sources of depression in the apple market in 1885 was the poor quality of apples put up. A man or woman that would stuff a barrel of apples on the inside with inferior fruit, should be hung higher than Haman. It is a most contemptible practice. You all understand facing apples at the end. It is not necessary to go into that. Put good apples into the barrel, good merchantable apples. I don't want to say that the apples in the middle of the barrel should be as fine as they are at the stemmed end, because the first look, the first impression is the best and helps to sell. Put everything in your barrel that is marketable. Use three bushel barrels, because that is the recognized size in this country, and especially in Europe. Press tight, don't be afraid because there may be an apple bruised in pressing. If they are pressed as they ought to be, they will ship better than if put in slack. Another question is how to market your apples. If you can get from seventy-five cents to a dollar a barrel for your fruit in your orchard or delivered at the station or market place near you, I advise you every time to sell it. Those that held their apples this year have made 100 per cent by holding. The outlook to-day is for a wonderful wealth of bloom giving promise of such a crop as we had in 1885. If we hold our fruit we shall commit the same error that we did then. Don't do it. There are modern ways of keeping fruit called cold storage. Fruit properly put in there will keep as long as the ice holds out and the building is perfect. It will keep for years. You may ask if it will stand up when brought out and exposed to the air? Not as well or as long, but until consumed or out of season. I have had a little experience in shipping apples to Europe. The sale of apples in Great Britain is practically unlimited; but only first-class fruits must be sent. Don't send any trash. Don't expect that you are sharper and keener than those people over across the Atlantic. You can't deceive them.

Now, in regard to the pear. The soil for the apple should be largely clay, I think that holds good in regard to pears. The variety of pears that I cultivate are largely the Bartlett, Dutchess, Anjou, and the Buffum. The Buffum is more largely to supply the market of Philadelphia, where it is in great demand. A great

many people think that there is more profit in winter pears than in early fall pears. My experience is to the contrary. I have made more money out of the Bartlett than any other pear I ever touched. You can always find a market for them at from two dollars and fifty cents to three dollars a barrel.

Is fruit culture profitable? That will depend precisely upon the premises. If you have got a taste for it, it is a profitable business. Bear in mind that it requires intelligence and vigilance — eternal vigilance. There are so many insects continually preying upon fruits, that it is only by vigilance that it can be made profitable. If the insects that depredate upon your fruit can be destroyed and the fruit remain intact, it pays. One of the worst enemies to fruit-growing is the borer, but it is easily kept in check, if you take it in time. Take a long, sharp-pointed wire, and push it into the orifice where he is imbedded, and it will wind him up. The next is the old-fashioned caterpillar; and I have found the best and the cheapest way to destroy them is to give them a dose of Paris green or London purple. Just spray that on your trees, and when the caterpillar takes his breakfast, he gets the poison and is gone. The next is the canker worm; this is the worm that defoliates your trees, making them look as though scorched; Paris green or London purple is the remedy. Next, the codling moth is a terrible enemy to fruit, but we have a remedy. Put sheep or hogs in your orchards where they eat up the little apples that contain the embryo worm, or spray the trees with London purple and Paris green. It is a demonstrated fact that the use of these will save over ninety per cent of the fruit; but there should be some concert of action amongst fruit growers in the State of New York, to make this a perfect success.

I am asked if fruit growing has been as profitable the last few years as some other branches of farming. I answer, if the orchards are well taken care of, it is equally as profitable. Use your brains, and you will succeed in fruit growing as well as with any other branch of farming.

Q. Do you believe in severe pruning for pear blight? Do you prune in spring for wood and in summer for fruit buds?

Mr. FENNER. — For pear blight prune as long as there is any indication of blight, if clear to the roots. Prune in the spring for wood and in the summer for fruit buds; anything that will stop the growth will send the tree to producing fruit buds.

Q. What time shall apples be picked?

Mr. FENNER.—If you want your apples to keep well pick them before they are thoroughly ripe; be careful when you pick them to handle them as tenderly as you would eggs.

Q. Would you advise plowing an orchard twenty-five years old, so that it may be manured and seeded again?

Mr. FENNER.—That would depend entirely upon circumstances; if the orchard was in soil rich enough to bear a good crop, I shouldn't plow it at all; I would sow German potash salts in the orchard and perhaps plaster, and if that didn't do I would then plow the orchard and give it a top dressing of manure.

Q. Should any crop be grown in the young orchard for the first few years?

Mr. WOODWARD.—I should certainly advise growing a crop in a young orchard until the trees have become nearly or fully large enough to bear; but you should remember this fact: That it takes more food to feed two or three hundred mouths than it does one; if you expect the trees to do well and your crops to do well, you must expect to feed the land on which the orchard grows; I would either crop it with potatoes, beans, or with corn, but would not tolerate any sowed crop.

Q. Will Mr. Fenner restate five of the best varieties of each, apples and pears?

Mr. FENNER.—The five best varieties of winter fruit are the Baldwin, Greening, Hubbardson's None-such, King and Cooper's Market, in the order named; in pears, I tie to the Bartlett first, last and all the time; then I would plant, in my section, the Dutchess and the Buffum.

Q. Is it a good idea; to put iron filings around a tree?

Mr. FENNER.—It is a capital idea, they contain just the elements that your trees need; put coal ashes around your trees; they are capital.

The Farmer's Garden; What it should Contain and How be Made.

Read at Lockport Institute, December 16, 1886,
By E. S. GOFF,
Horticulturist of the New York Experiment Station, Geneva, N. Y.

The farm is probably the outgrowth of the garden. The farm implies a certain organization of society, and more or less of commerce. The garden, on the other hand, need imply no more than the family. The first rude savage who thought far enough to protect the wild bush or tree, or the fleshy root that gave him his favorite food, was the unconscious father of the art of gardening. The first human family, of which we have any knowledge, lived in, and cared for a garden, and from that day to the present, the garden has ever been the accompaniment of the peaceful and thrifty rural home. I suspect that it is only within the past half century, and in our country of cheap land and dear labor, that the economy of the garden, as a helpmeet to the rural family, has ever been questioned. Strange to say, the first doubts of this kind come from the farmers themselves, the very people whose labors and associations should bring them nearest to the garden. The suburban laborer, mechanic, and professional man still believe in and delight in growing their own vegetables whenever their means make it possible, but I hear some farmers raising the question whether the garden is longer worth maintaining as an adjunct to farm life.

My impressions are that the farmer's garden has been gradually declining during the past quarter of a century, if not longer. It can hardly be said that our farmers are becoming less industrious or provident than they once were, and the decline of the garden is more probably, due to the substitution of machinery for hand labor in almost all departments of farm work, and the growing tendency of the times towards specialization. In the days when the mowing

and reaping, and raking and threshing were done by hand, a gang of men was needed on every farm for a large part of the year. During the frequent interruptions in field work, the garden and wood-pile served as a convenience for keeping the men together and contentedly employed. Now all has changed; one or two month-men, with the aid of our perfected machinery, do the greater part of the work of the farm. The garden, with the careful attention that it needs, comes in as so much extra load. Being considered of less moment than the field crops, it is generally neglected, and too often, the weeds hold high carnival in the inclosure that, a score of years ago, was famed for the high quality of its vegetables.

Many farmers acknowledging the value of the garden fail in their efforts to maintain it; while others illustrating their faith by their works, reap its full benefits.

These are acknowledged to be days of starvation prices. The profits in dairying are said to be ruined by oleomargarine; the wheat, corn and beef markets are sorely depressed by over-production on the great western plains, and yet, I hear farmers claim that they can buy the vegetables for their own table cheaper than they can grow them. The market gardener in growing these very products uses soil the rent of which is many times that of the farmer's land. He pays far more per acre for manure than does the farmer, he wholesales his products, for about half what the farmer has to pay for them, and yet as a rule he makes more money from them, than does the farmer on his staple crops. Is there not some mistake in the farmer's logic, when he claims that he can not afford to raise garden truck for his own family? But this is not all. Those farmers who depend upon buying their vegetables, often only half carry out their purposes. In busy seasons they do not go to market, or if they do, other matters engross the attention, and the garden truck is forgotten. Yet the table must be supplied with something, and instead of the wholesome and palatable products of the garden, less wholesome and more expensive pastrys and puddings are used, and the farmer wonders why his grocery, if not his doctor bills are so large. I think it would be wiser on the whole if many farmers would, as Professor Roberts puts it, let part of the farm "go to grass," and devote more attention to those things that tend directly to comfort and independence, among which the garden comes first.

A few months ago, Professor Bailey, of the Michigan Agricultural College, read a paper before the Massachusetts Board of Agriculture, entitled "The Garden Fence." He maintained that the garden fence has proved an obstacle to progress in horticulture, because the botanists have not yet found their way inside of it, and the horticulturists have not climbed over it. I agree with the professor, and would go still farther. The garden fence has proved a great obstacle to success in the farmer's garden because *it has so effectually kept his horse and cultivator on the outside.*

The old garden, pent up between four short fences and hedged about and across with rows of currant and berry bushes, is unworthy the present age. There should be free sailing for horse culture.

I do not mean that there should be no fence at all. On the contrary, I would have a high and tight fence on the north and northwest. This would prove useful not alone in keeping out stock, but as a protection from cold winds. In England, the north garden wall is considered almost indispensable, for its warming influence alone. Vegetables grown under its protection are fit for use decidedly earlier than those grown elsewhere. We can adopt this suggestion with profit, particularly in the fruit garden, and by its means, successfully grow varieties of small fruits that would not endure our winters without some protection from their rigors. A wind break of Norway spruce, or Austrian pine is far more beautiful, and, when grown, decidedly more effective than the most elaborate fence, besides being cheaper of maintenance. The only objection, is that in time of drought their roots drink up water that is needed by the garden crops.

I would emphasize one thing. Do not scrimp the pattern of the garden. Make it long, and as wide as you choose. Extend the rows the long way, and leave a good broad space across each end unplanted, on which to turn the horse. Thus arranged, a few minutes work with horse and cultivator once a week, and an equal time with the hand hoe, will suffice to keep the weeds in subjection. It is well to have a light cultivator, that has narrow teeth, and of which the sides admit of close adjustment, on purpose for the garden. With such a tool there are few garden crops that may not be freely cultivated with the horse.

I think it best to divide the garden into two parts, one for those plants which require to be planted every year, and the other, those which, when once planted, remain for a term of years. The first

will contain nearly all of what are known as vegetables. The second will contain the small fruits, asparagus, rhubarb, herbs, etc. These two gardens, which will naturally come to be called the fruit and the vegetable garden, require quite different treatment. It is not necessary, or even desirable, to have them in separate inclosures.

Onions, the tops of which are very small, and of which it is thought best not to cover the bulbs with earth, and the radish, which is very subject to insect pests, had better be grown in beds by themselves, where they can be cultivated by hand. But these are the only vegetables that I would exempt from horse culture.

In the case of vegetables that require transplanting, as cabbage, cauliflower, celery, tomatoes, egg-plant, etc., I incline to the opinion that it is wiser for the farmer to buy the young plants from someone who grows them for sale, than to provide and take care of the hot-bed and cold-frame necessary to grow them himself. And besides, the labor of growing these plants up to the time that they are large enough to put out in the garden is generally as much as, if not more than, all that is required afterward to bring them to maturity, and the cost of the plants, deducting the price of the seed, is but a mere trifle.

What should be grown in the farmer's garden? There is first, to choose the vegetables and fruits, and second, the choice of varieties. The answer to the first is simple enough—grow those things that your family like best. The question of varieties, however, is of more importance than some suppose. The seed of the best sorts usually costs little, if any, more than of the poorest, nor does it cost more to cultivate a good than a poor variety, but the product of the good is often immensely superior to that of the poor. Our elaborate tests of varieties at the station have enabled me to find out which are best under our conditions. I give a list of such as have appeared desirable. I name more than one variety, because it may be difficult to secure seed of a particular sort.

Bean-Bush.—Golden Butter Wax, Early Yellow Six-weeks, Dwarf Cranberry, Dwarf Horticultural.

Pole.—Horticultural.

Lima.—The Small White is one of the earliest.

Beet.—Egyptian and Eclipse, for early; Half Long Blood, for late.

Cabbage.—Early Wakefield, Early Summer, for early; Winnigstadt, Schweinfurt, Drumhead Savoy, for medium; Fottler's and premium Flat Dutch, for late.

Carrot.—French Forcing, Early Horn, for early; any of the half-long orange sorts, for late.

Cauliflower.—Henderson's Snowball, for early; Le Normand's Short stem, for late.

Celery.—White Plume, for early; Boston Market, Crawford's Half Dwarf, with some of the red or pink sorts, for late.

Cucumber.—Russian Netted or Early Cluster, for early; Tailby's Hybrid, for late; Green Prolific Pickling, for pickles.

Egg-plant.—Extra Early Dwarf Purple, for early; New York Improved, for late.

Lettuce.—Prize Head, Large White Stone Summer, White Chavigne, Deacon.

Muskmelon.—Montreal Nutmeg, Chicago Market, Christiana, Netted Gem, Jenny Lind.

Watermelon.—Vick's Early, Phinney's Early, Black Spanish; the last has sometimes failed to ripen at Geneva.

Onion.—Yellow Danvers, White Portugal.

Parsnip.—Round, for autumn use; Hollow Crown, for winter or spring use.

Pea.—For early, Philadelphia, Kentish Invicta; these two varieties include nearly all of the first early peas of our catalogues; for late, Stratagem, Pride of the Market, Market Garden.

Pepper.—Golden Dawn, for mangoes; for sharp peppers, Cayenne, Chili, Cranberry, or Cherry.

Radish.—Early Frame, Early Long Scarlet, Chartier's, for summer use; Chinese Rose, for winter.

Salsify.—But one variety is extant.

Spinach.—Viroflay.

Squash—Hubbard, Marblehead, Perfect Gem.

Sweet Corn.—Corey or Marblehead, for early; Stowell's Evergreen, for late.

Tomato.—Acme, Livingston's Perfection.

Turnip.—Purple Top Munich, for early; Jersey Navet, for medium; Cow Horn, for late.

Ruta Baga.—White French, Sweet German.

For those who enjoy testing the rarer class of vegetables, I mention the Celeriac, or turnip-rooted celery, the Hamburg parsley, and the Florence fennel, or Finnoccio, as being well worth growing.

Blackberries.—Wilson's Early and Kittatinny, though neither of these is all that is to be desired.

Currants.—Fay's Prolific, White Grape; for those who like black currants, Lee's Prolific.

Gooseberries.—Industry, Downing.

Raspberries.—Cuthbert, for red; Caroline, for white; Gregg and Ohio, for black.

Strawberries.—Crescent, Sharpless, Prince of Berries. I recommend the first as the one best able to take care of itself; the second as combining great productiveness and size with fair or good quality; and the third for superior table quality, with fair productiveness.

Of the vegetables that are appropriate in the fruit garden, on account of their perennial habit, I recommend:

Asparagus.—Moore's Crossbred, Conover's Colossal.

Rhubarb.—Scarlet Nonpareil.

As many of the perennial sweet herbs may be added as are desired.

I shall not attempt to give detailed directions for the culture of these plants, that would consume too much time. A few hints of a general character, with brief directions for managing insect pests must suffice.

I would assure you that the best soil for a garden is a rich soil. I have more faith in *manure*, as an element of success in gardening, than in any other one thing, clean culture excepted. To avoid disappointment, order seeds directly from some seedsman who has standing and reputation at stake. Especially order them early, so that they may be on hand when wanted. Remember that successions of many of our vegetables — beans, peas, radishes, lettuce, etc.— should be planted, in order to secure full benefit from them during the season. Remember that roots packed in sand during winter preserve their freshness and flavor much better than if simply dumped into a box or pile on the floor. Remember, finally, that weeds grow faster and in greater variety in the garden than in the corn-field, and hence need closer attention.

I can not give you any panacea for insect injuries. We must battle with each pest according to its habits. In order to grow radishes, free from maggots in the roots, plant them in a bed of sand, and to prevent the flea-beetles from destroying the foliage, place the bed if possible within a bit of sod ground, and surround it with a tight frame of boards at least a foot high. For the green

cabbage worm, I have found pyrethrum, or Persian insect powder, the most satisfactory destroyer. If the powder is of good quality it will bear diluting with twice its bulk of air-slacked lime or flour, and if the mixture is allowed to stand a few hours before being applied, it will prove more effectual than if used immediately after mixing. The Woodason bellows is an excellent implement for distributing the powder. The best time to apply it is on a quiet evening, when the dew has just commenced to fall.

For the striped cucumber beetle, prevention is the only method that I have found satisfactory. Cover the hills before the plants come up with narrow frames covered with mosquito netting.

For the squash vine borer, I find cobs dipped in coal tar and placed among the plants of great benefit, but not a perfect remedy. The cobs should be placed in the hills about the middle of June, and they should be dipped in the tar again once a month or oftener during the season.

For the currant worm, I have found nothing better than the old remedy, viz., powdered white hellebore applied either dry or in water.

Perhaps you have expected, as the result of experiments at the station, that I should be able to tell you of some royal road to a good garden, without the usual embarrassments and failures. If so, I can only say that we have not found a way to escape the curses that God pronounced upon Adam in the first garden of which we have any knowledge. The earth would bring forth as many thorns and thistles, and would breed as many destructive insects in our garden as in yours, did we not prevent it by eternal vigilance. We have our full share of annoyances, from seeds failing to grow, from injuries by drought, and hail and frost, and yet we are making progress.

In conclusion, I desire to say something in behalf of the farmer's son, and in this I speak all the more confidently, because I speak from experience. The discipline of the farm is too often of the sort to disgust the young with the garden. They see it only in its worst aspects. The way in which the farmer's garden is too often managed, or rather mismanaged, renders it a repulsive rather than an attractive place. But this is not all. The garden too often hangs over the farmer's son, as the dreaded place where the little leisure that might have been is consumed. If the garden is to be maintained, only by the sacrifice of the few breathing spells that

come to the farmer's boy, then by all means let it be abandoned. The labor of the garden should be managed like the labor of the farm. If the corn-field becomes weedy, extra help is hired to clean it out, the boys are not expected to do it, out of reasonable working hours. It should be the same with the garden.

The future of agriculture in this country must tend more and more towards the garden. In the densely peopled countries of the old world, the farms have long since been divided and subdivided, until they are little more than market gardens. In our own Atlantic States, the same law is already tending to the same result. It is the more necessary, therefore, that in their home-life, our farmers' sons should be educated to the truth that in the garden, which experience too often leads them to despise, lies one of the surest fields for a healthful, honorable, and independent living. They should be permitted to see something more than the dry bones and abuses of horticulture. They should become acquainted with some of its beauties as well. They should be encouraged to learn not simply the art, but the science. They should be taught how new varieties are produced, and be encouraged to raise seedlings and make crosses of their own. They should learn something of botany, and lend a helping hand in developing some of our promising wild fruits. As Professor Bailey says, they should be permitted to climb over both the garden and farm fences, and learn something, not simply of grain and stock, but of fruits and vegetables, and flowers and forests. Thus they will come to love both the farm and the garden, while the trees and the vines of their own planting, growing up with them, will endear the old homestead to them with ties that continually grow stronger and stronger as the years roll by.

Colonel CURTIS.— The trouble with most farmers' gardens is that they are surrounded with too many trees. They rob the ground of fertility, and the surface of sunshine. I have had excellent success in growing garden truck on a strip, on the side of my corn field. The only trouble with that plan is that sometimes it is too far from the house.

Mr. WOODWARD.— I always substitute all the machine culture possible for hand or finger culture. I have no doubt but the one great reason farmers have such poor gardens and so little of them, is because of a want of the knowledge how to use horse, and machinery, aids in their cultivation.

It has always been a source of wonder to me that so few farmers raise celery, when it is one of the healthiest and most delicious vegetables grown. It should be on every table at least twice a day from November till May, and can be kept as easily as potatoes. To keep well, it only needs packing upright and close together in a dark, cool place, and with plenty of moisture about its roots.

Mr. REMINGTON.— I have trouble in keeping celery. I packed mine with three or four inches of dirt among the roots, put it in the cellar and watered it once a week by sprinkling water over it, and still it rotted so badly we were obliged to use it as rapidly as possible, and then it was in bad condition.

Mr. WOODWARD.— The mistake was in the watering. Celery is very quickly spoiled by putting water on its leaves or in its hearts. Water in such a way that the water reaches the roots without coming in contact with its tops. A good way is to stand it in boxes made water-tight at the bottom, but with holes bored three inches from the bottom, and with a piece of board put diagonally across the corner so that water can be poured down this to the roots. Celery is naturally a water plant, and if it have plenty of moisture at its roots, no matter whether there is any dirt there or not, it will keep nicely.

Q. How can celery be easily blanched? I grow Boston Market, and put it into three-foot trenches covered with boards and litter, and still it doesn't blanch well.

Mr. TROWBRIDGE.— Boston Market does not require as much blanching as some others. It is tender and sweet without it; as much so as other varieties that blanch so much easier, are when blanched.

Mr. GOFF.— The self-blanching celeries are capital for farmers' use. They can be grown almost without hilling; only enough to keep the leaves upright and close together. Some of the best are White Plume, and Golden Self-blanching. I think the latter the sweeter and better.

Contagious Diseases in Animals.

Delivered at Ithaca Institute, Feb. 18, 1886,
By Professor JAMES LAW, F. R. C. V. S.,
Cornell University.

Mr. Chairman, Ladies and Gentlemen.— The study of contagion to-day is essentially the study of the work of parasites, or minute living beings that subsist on other living beings. The contagious fevers of man and animals are now nearly all demonstrated to be the result of the propagation in the system of the most minute of these living beings — the bacteria. These, as found in the body, are the simplest of all vital organisms, being in the form of simple cells or filaments, straight, bent or spiral, though they do grow into other forms in different cases when removed from the animal economy. To give an idea of their extreme minuteness, I may say that if 15,000 of the *Bacterium termo* were placed end to end they would form a chain extending about exactly one inch. On the table they are mainly shown in company with the red blood globules so that their relative size may be appreciated. The blood globules are individually about $\frac{1}{3200}$ of an inch in diameter.

Bacteria like other living beings perform all the functions of organic life; they feed, excrete, multiply their numbers, and produce elaborate chemical products, in many cases of a highly poisonous nature. Those living in free air and feeding upon carbo-hydrates produce as a rule little or no elaborately poisonous products; those living in confined spaces, apart from air, and feeding upon flesh-forming or nitrogenous compounds, tend to produce poisons more or less deadly. These are the bacteria that are fitted to live in the animal body, to poison it and to create diseases of a contagious nature. Then again, different bacteria require for their active life different amounts of air, heat, light, and electricity and if these are widely different from those found in the animal body they can not live in that body and become a contagion. Others require special chemical conditions of their food, and if they can not find

these in the animal body they can not fix themselves upon it as parasites. As an example, most of the animal juices are alkaline or neutral, and can only maintain bacteria that normally live in alkaline or neutral solutions. If a germ requiring an acid liquid is introduced, it can only survive in the acid contents of the stomach or large intestines or in the acid secretions of the skin or open sores. For the same reason the alkaline-feeding bacteria, if taken with food, are to a large extent destroyed in passing through the acid stomach which thus acts as a protective sentinel, keeping guard over the intestinal canal. It is only during disease of the stomach or in the absence of its acid contents that these bacteria pass it scatheless. When, however, the bacteria have formed spores, these like dried seeds may safely pass through the acid stomach and germinate in the intestine.

Again, bacteria are the common scavengers of the universe. We have long known that plants and animals reciprocate with each other, in producing each the food required by the other. Plants take up simple soluble and gaseous materials and build them up into complex compounds, fit for the food of animals. Animals, on their part, break down these complex compounds, and furnish them again to the plants in the simple forms available for their food. In the case of carbon dioxide, ammonia and some other forms, this is true, but after this there is still a large body of animal products, that are not soluble in water, and not available for plant food. Those, it is the function of the bacteria to transform and prepare. They are the cooks of the vegetable creation. Every fermenting manure heap, every rotting vegetable and animal is a great kitchen in which this preparation of vegetable food is going on. But for the constant beneficent work of the bacteria the world would soon be choked up with the undecomposed remains of plants and animals, and vegetable and animal life must alike perish. They are at once the scavengers, caterers and cooks of nature, then, and as no living beings are so widely distributed so no living beings are more beneficent in their work. When covered or preserved foods fail to keep, it is because we have failed to kill all the bacteria, when we make bread, beer, wine, sauer kraut and other common products we harness these infinitessimal beings and employ them for our uses.

This much, it is only fair to say for these most minute but much dreaded beings, taking them all in all, they do far more good than

harm. It is only a few that can enter the animal body, feed upon its elements, and produce disease. Of these few, I would make one or two hasty remarks.

Bacteria that grow apart from free air, in nitrogenous material, having an alkaline reaction, can in some cases attack the animal system, and live on it. They seem to do this mainly by virtue of two of their products: First, a poisonous vegetable alkaloid, and second, a soluble ferment or solvent of the materials making up the animal tissues.

The primary attack comes from the poisonous alkaloid which lowers or destroys the vitality of the cells of the lymph, blood or tissues, so that they can no longer resist the chemical action of the ferment. The second assault is made by the ferment in dissolving the animal cells and tissues, and rendering them up in this condition as food for the living bacterium.

It should be noted here that the living corpuscles of the blood, and the living cells of the animal tissues, are also endowed with power to produce a ferment or digesting principle, which is also deodorizing and disinfectant, and which can safely dispose of any very small amount of bacteria poison introduced. When the virus is introduced, there is at once set up a contest between the bacteria and their products on the one hand, and the animal cells and their products on the other, and, as in other contests, the stronger or the most advantageously situated prevails.

But the animal cells can acquire a power of resistance to alkaloid and other poisons, and thereafter resist any moderate dose. Thus many of you have acquired a comparative immunity from the poisonous action of nicotine, the deadly alkaloid of tobacco; and other men have acquired immunity as regards alcohol, opium, ether, chloral, arsenic or other poison. This immunity is acquired by accustoming the animal cells to bear the poison in question, and this is the explanation of the fact that many contagious diseases will not readily occur a second time in the same individual.

As regards the reproduction of bacteria, many of them can double their numbers every hour when placed in the best conditions for their activity. In such circumstances, then, a single bacterium would in twenty-four hours produce no less than 16,777,220. At the end of forty-eight hours the offspring would amount to 281,500,000,000, and would fill a half-pint measure; all

produced in two days from a single germ measuring $\frac{1}{15000}$ of an inch in length. The figures are easily tested. It is the old story of selling the horse at a cent for the first nail in his shoe, two cents for the second, and so on doubling the value each time to the thirty-second nail. Whoever has worked out this problem, will not be surprised at this marvelous increase in the bacteria.

Fortunately, however, bacteria can rarely so propagate themselves; they meet with all sorts of drawbacks, and thus, in spite of their enormous fertility, the survivors are, in a general way, only enough to keep up a fair balance in nature. The disease-producing bacteria, however, have no such claim upon our forbearance, and in these, the enormous fecundity is a fact that we can not too closely contemplate. Some, like the bacillus of tuberculosis and glanders, propagate themselves slowly, but the great majority of the bacteria causing animal plagues, will, in favorable circumstances, double their numbers hourly, so that you can judge for yourselves whether it is best to preserve infected animals, the systems of which are the spheres of this extraordinary fecundity of poison, or to obliterate the system, the poison and the rapidly growing danger at one blow. It is manifest that the limits naturally set to the propagation and increase of one of these plague-bacteria are only set by the number of animals that are susceptible to its attacks, and within its reach. The greater, therefore, our live-stock possessions of a genus receptive of a given poison, and the more the material wealth of this kind at stake, the more rapid is the spread of the infection, and the greater the national loss.

It also follows, without saying it, that a specific plague bacterium, unknown on this continent for the centuries since its discovery and finally imported from abroad, should be stamped out remorselessly and at once, whatever the temporary inconvenience and outlay. We have heard that the only way to root out thistles is to draw off the coat and eradicate them one by one, by sheer manual labor. But no amount of labor nor effort which the individual man can apply can root out these *bacteridean weeds*, that average only $\frac{1}{15000}$ of an inch in length, that can only be seen under the highest available powers of the microscope and then only after they have been deeply dyed with some bright pigment.

I have presented on the screen a partial list of the disease-producing bacteria of the farm animals, so as to give some idea of the

extent of this great subject. This is, however, only the beginning of the animal plagues caused by parasites. The fungi and animal parasites are responsible for a long list beside.

DISEASE-PRODUCING BACTERIA.

1*st*. *Micrococcus*.—Round or Ovoid cell.

M. of cow-pox and horse-pox.
M. of sheep-pox.
M. of cystitis.
M. of erysipelas.
M. of ulcerative endocarditis.
M. of osteo-myelitis.
M. of lobular pneumonia (horse).
M. of lung plague (cattle).
M. of influenza.
M. of suppuration.
M. of septic wounds.
M. of gangrenous wounds.
M. of fowl cholera.
M. of diphtheria.
Diplococcus of swine plague.
Sarcina of the stomach.
Sarcina of the urine.

2*d*. *Bacterium*.—Short Rod.

B. of blue cream.
B. of yellow cream.
B. of red cream.

3*d*. *Leptothrix*.—Chain of very fine cells.

L. of mouth and carious teeth.
L. of abortion (cattle).

4*th*. *Bacillus*.—Fine Filament, Straight or Bent.

B. of Anthrax.
B. of malignant Œdema (horse).
B. of glanders.
B. of tuberculosis.
B. of septicæmia.
B. of swine plague.
B. of carious teeth.
B. of leprosy.

5*th*. *Vibrio*.—Wavy, Flexible Filament.

V. of emphysematous anthrax (black-leg).
V. of septicæmia.
V. of cholera (comma bacillus).

6*th*. *Spirillum*.—Spiral, Rigid Filament.

S. of relapsing fever (horse).
S. of milk-sickness.
S. of gums and teeth (spirochœte Cohni).

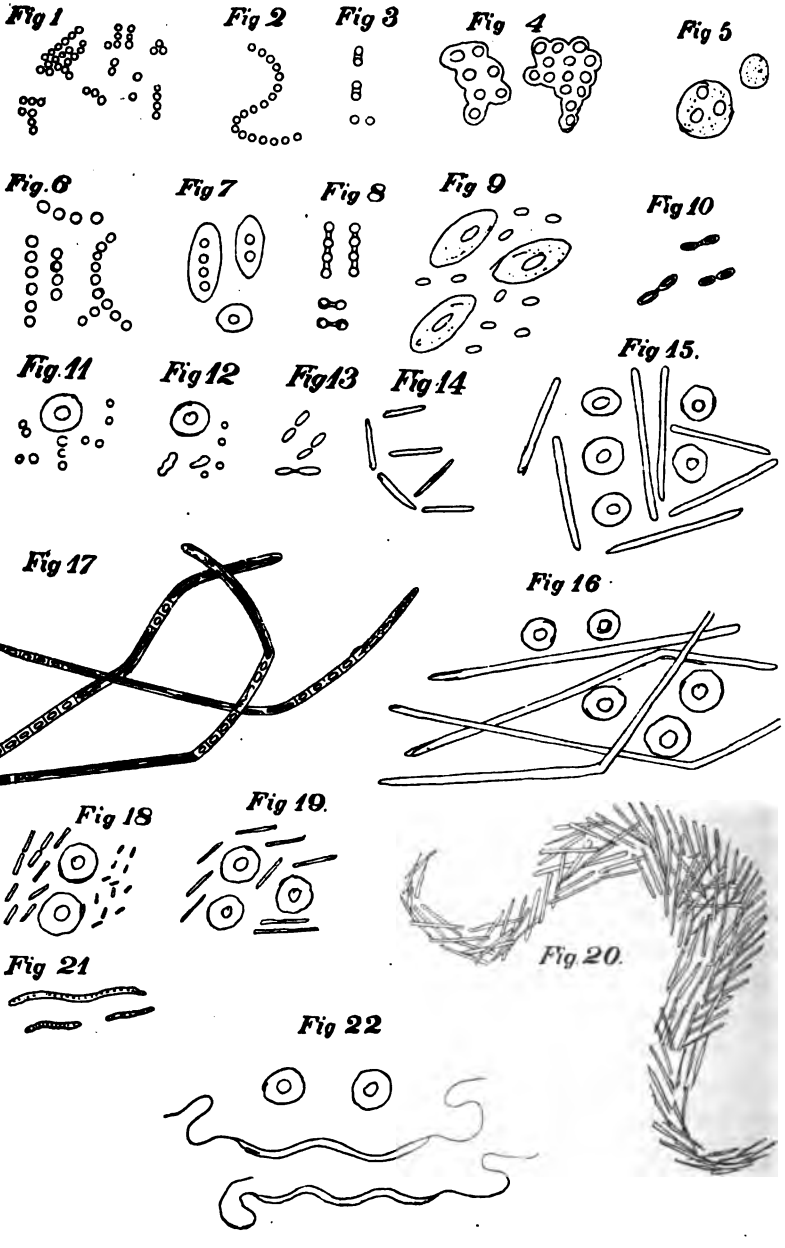
Fig 1
Fig 2
Fig 3
Fig 4
Fig 5
Fig. 6
Fig 7
Fig 8
Fig 9
Fig 10
Fig. 11
Fig 12
Fig 13
Fig 14
Fig 15.
Fig 17
Fig 16
Fig 18
Fig 19.
Fig 20.
Fig 21
Fig 22

DESCRIPTION OF FIGURES.

Fig. 1. Micrococcus vaccinæ. (Cow-pox.)

Fig. 2. Streptococcus. (Spherical bacteria in chain.)

Fig. 3. Diplococcus. (Spherical bacteria in pairs.)

Fig. 4. Staphylococcus. (Spherical bacteria in groups or clusters.)

Fig. 5. Macrococcus monas. (Large spherical bacterium.)

Fig. 6. Micrococcus ureæ. (Infecting inflammation of bladder.)

Fig. 7. Pneumococcus. (Bacteria of lobular inflammation of the lungs.)

Fig. 8. Micrococcus Pasteuri. (Septicæmia in rabbit from inoculation with saliva of man.)

Fig. 9. Micrococcus of fowl cholera and oval blood globules.

Fig. 10. Bacterium termo (of ordinary putrefaction).

Fig. 11. Micrococcus of lung plague of cattle (contagious pleuro-pneumonia) and blood globules.

Fig. 12. Micrococcus of rinderpest (Russian cattle plague) and blood globules.

Fig. 13. Diplococcus of swine plague.

Fig. 14. Bacillus of swine plague.

Fig. 15. Bacillus anthracis (from blood of infected Guinea pig) and blood globules.

Fig. 16. Bacillus anthracis, after three hours cultivation in broth, and blood globules.

Fig. 17. Bacillus anthracis, forming spores.

Fig. 18. Bacillus from septicæmia in mouse — two species — large and small, and blood globules.

Fig. 19. Bacillus tuberculosis, and blood globules.

Fig. 20. Bacillus tuberculosis, in sigmoid colony from kidney.

Fig. 21. Vibrio.

Fig. 22. Spirillum of "surra" (equine relapsing fever) and blood globules.

This opens the way for a consideration of plague-prevention. But the public appreciation of preventive medicine is still at a very low ebb. It has been aptly said "People will give millions for cure but not a cent for prevention." It is incomprehensible how year after year and generation after generation, we can see the human race dying off from preventable diseases, and yet with a true Mohammedan fatalism accept it all as the inevitable. It is astounding to contemplate the thousands of tons of quack remedies — so called — which mankind yearly swallow, for maladies which are chargeable only on their own ignorance, or neglect of available means of prevention. Still more astounding is it to see the plagues of animals imported into a new country, and by the most criminal negligence, allowed to acquire a general prevalence, when the prompt sacrifice of one animal, of one hundred or of one thousand, could at the different stages have put a final stop to the contagion. Yet all radical measures for the extirpation of animal plagues are habitually treated with neglect or active opposition, the advocate of such measures is told that his office is "to cure, not to kill," and his reasoning is scouted as "the logic of the pole-axe," and all this not by the common people alone, but by those whose position would warrant us to expect from them better things. The editors of powerful newspapers, who can surely never have given five minutes sober and intelligent consideration to the subject, join in this cry, and quite recently Mr. Clare Sewell Read, M. P., in an agricultural address bewails that "Veterinarians can only advise us to kill." Now in view of the facts that we can check these plagues by segregation, by disinfections, by preventive inoculations with a virus that has proved itself mild, with that which has been robbed of the greater part of its potency by heat, by starvation or by oxidation, or by that which has been completely sterilized by heat, and finally that in regard to some plagues we can render the animal insusceptible by a special food or a special medicine, I venture to assert, and that boldly, that the veterinarian is better provided with preventive measures than are physicians of to-day.

It is true that we can not exercise omnipotence and extinguish infection with a word, nor can we mail to any point a much desired, and very widely believed in, panacea, which will cure the victims of all contagia from ring-worm to rinderpest. But we can, in suitable cases, procure such conditions of life and such power of resistance in the animal economy as will render the assaults of given plagues harmless.

As veterinarians, however, and as citizens, it is not for us to advocate especially those measures that will protect the individual animal, or individual herd, at the expense of danger to those around them, when more radical and in the end cheaper measures can be availed of to obviate all necessity for these partial and dangerous methods of protection. Veterinarians have been freely slandered for an alleged desire to draw money from the public treasury. The wonder is rather that more of the profession have not pandered to the public prejudice and engineered public culture establishments from which the variously modified virus could have been sent out all over the country at a handsome profit. Have our detractors ever thought of how many millions it would cost every year to inoculate the hogs of the United States as a protection against swine plague? And of how many millions more it would take to inoculate against each of the other animal plagues now existing in the land? The radical and thorough extinction of these plagues, which, to their credit be it spoken, the better class of our veterinarians have consistently advocated, has for its purpose the speedy removal from the land of all need for preventive measures, apart from those aimed at the prevention of the renewed importation of infection, and such measures, are therefore the only ones that look toward the lessened remuneration of veterinarians as a body. In the face of these indisputable facts, does not their consistent advocacy of extinction of contagion savor more of public spiritedness than of the selfishness so slanderously attributed?

For the instructed and high-minded veterinarian the question is mainly one of political economy. It is simply a question of how we can, at the cheapest rate and in the shortest period, rid ourselves forever of our pestilential enemy, and at once abolish all future loss and vexation coming from this source. There is only one answer: By the prompt and remorseless extinction of every germ of contagion. We need make no account here of the sacredness of life. The killing of an infected and infecting animal is not murder. We entertain no compunction concerning the tens of thousands of animals that daily die under the knife of the butcher and the lives of which might have been prolonged with safety to others. Why should we hesitate to sacrifice the few, whose systems are multiplying by inconceivable myriads the germs that are so deadly to others of their race, and which, in the case of

several plagues, are now costing the country more every year than it would cost to exterminate them once for all? The question is essentially one of dollars and cents. The main moral elements that enter into it are the questions of the remuneration of the stockowner for the animals expropriated for the public good, and the protection of the public at large from the consumption of diseased and often dangerous meat and milk. The last question is more effectually met, by thorough extinction of the pestilence, than by any other method, and the indemnity of the owner, in no niggardly spirit, is a simple act of justice on the part of the nation toward the citizen. That this is the imperative duty of the nation as represented in its national government is a truth beyond all dispute or cavil.

But what do we see in this enlightened American nation, in this nineteenth century? I shall confine my few remarks to the lung plague of cattle, which is at present the most vital issue among our animal plagues. We see an infectious disease imported in 1848 from England, where in forty years it cost that nation $500,000,000 on an average bovine stock of 6,000,000, and practically left to spread among our 30,000,000 head of cattle, so far as any efficient legislation or administrative efforts for its restriction or extinction are concerned. We see this plague creeping onward near our Atlantic seaboard for thirty-six years, ravaging the dairy herds of our largest eastern cities, steadily entailing a yearly increase of losses, and threatening at any moment to be carried west in the systems of thoroughbred cattle to our open grazing grounds, the source of our cattle trade, and through that to pollute the cattle traffic in all its ramifications. But our warnings are unheeded, and the foreign infection must take its course.

In 1878 England finds diseased American cattle landed on her shores, and immediately imposes an embargo on our live animals which costs us $2,000,000 and upward per annum. Surely now the stream of infection will be turned! We show that the amount of our yearly loss, $2,000,000, judiciously expended will forever rid us of this infection, and that next year or the year after, when the plague shall have extended to our open ranges, the opportunity may have been lost to stamp it out at any cost — even the most fabulous. But no, the lesson has not yet been learned and the infection holds on its way.

In 1880–1 a trade sprang up in eastern calves, of common

breeds, to be sent west to be matured on the western pastures. Danger is piled on danger. Heretofore pedigree stock only have been shipped west, and as these are usually sent into carefully secluded herds, and are easily traced back to the seller through the herd-book if in no other way, there appeared to be some shadow of protection for the great west, and the traffic diverging from it. But now common calves are picked up by speculators everywhere, preferably in the cheapest markets (consequently, as likely as not, where disease exists or threatens), and are shipped to Chicago, St. Louis and Kansas City to be raised on the cheaper western land. In different cases, calves that could not be sold in the larger eastern cities were shipped west in this way. Once more the warning is sounded, and once more our National Congress turns a deaf ear. Now, however, some of the Western States and territories are aroused, and they refuse to admit cattle from the districts known to be infected in different States, except after examination and certificate of a State Veterinarian. For the first time, we now see some disposition toward self-protection, but the result is wofully inadequate. In these days of rapid transit the difference between shipment from Jersey City and from Elmira, is only a difference of ten, or at the most, twenty-four hours. A simple examination by a State Veterinarian for the purpose of detecting a disease that may lurk undiscoverable in the system for three or four months is utterly delusive. Like Macbeth's witches, it "keeps the word of promise to our ear and breaks it to our hope." To-day a distant proscription of a given locality, and a certificate granted on the basis of a single examination, are but juggling with the country's interests. It was something, however, to see a large body of stock-owners showing a disposition to check the advancing flood of infection. Ignorant and ill-directed efforts may be improved upon, a good purpose is at the basis of all sound action, though without due intelligence it may not be able to inaugurate it.

Time advances, and at last, in 1883, the infected Jerseys from Maryland carry the plague into the Mississippi Valley. For a time it is not recognized, or if it is, it is kept secret until it has spread into five adjacent States. Fortunately it has traveled west in registered cattle and has apparently been confined to registered herds. It may still be possible to meet it successfully and at little cost. But how is it met?

Firstly. Denial by the Chicago Live Stock Exchange and its dependents.

Secondly. Derision by nearly all the prominent newspapers, including, I regret to add, many nominally agricultural sheets.

Thirdly. Indifference by the great body of our farmers and people.

Fourthly. Neglect by the National Congress.

The infected States, however, do move slowly to extirpate the plague, and having destroyed the herds known to be infected, they proclaim their respective States sound, and demand the raising of the embargoes that had been imposed by other States.

They knew little of the insidious enemy they had got to deal with. After a year of alleged immunity, the Mississippi Valley and the whole country were again startled by the widespread prevalence of the lung plague in and around Chicago. This new outbreak was no longer in carefully secluded thoroughbreds, sold under protection of a herd-book record and easily traced back to former owners, but in the distillery stables filled with common steers, and in the city cow-sheds, filled with ordinary cross-bred cows. It was no longer in herds that were vigilantly guarded against contact or possible taint with less noble blood, and which were sold only at fancy prices for stock purposes, and concerning which the sale in a public stock-yard would have sounded like a degradation. No! these victims are largely fattening cattle, due in the largest stock-yard in America or in the world, as soon as they are prepared for the butcher. Or they are cows that will be put up to fatten as soon as they fail in their milk, and will finally gravitate into these stock-yards as beef. Now, one would suppose, the Chicago Live Stock Exchange will repent of their opposition, but no, they deny the existence of the plague until denial will no longer avail, and meanwhile it comes out that inoculation had been extensively practised on the cattle in the distillery stables and city cow-sheds, that interested parties had sent to Brooklyn for a man to teach them the art, and that for at least a year the true nature of the plague had been sufficiently well known, but that in place of seeking to protect the country, the stock-owners, had covered up the truth and sought to save their own pocket-books at the expense of the spread of the disease by an indiscriminate inoculation.

Little has been said of the probability of the infection having been spread through the Chicago stock-yards. Even papers which

like the *Breeders' Gazette, The National Live Stock Journal,* and others, have consistently advocated the extinction of the plague, have never been betrayed into a statement that the infection may possibly have escaped through these stock-yards. But I put it to your common sense. Is it reasonable to suppose that with the plague prevailing in the adjoining distillery stables for over a year, none of all the cattle fed in these stables, for early slaughter, were at any time turned into these stock-yards for sale? Steers don't take a year to fatten, and their natural destination is the public market where they may pass into the hands of the butcher or packer. Is it likely then that the same men who hid this plague away for a whole year in their feeding stables, where cattle were constantly coming and going, who boldly denied its existence when charged upon them and continued the denial in spite of the most obvious facts, and who had meanwhile been inoculating all and sundry without a compunction as to the resulting spread of the disease; is it likely that these men, so heartless in other respects, should be so compassionate of the country in this one direction, as to avoid sending a single animal into the public stock-yards? Is it likely that they would be at considerable trouble and loss, in killing such cattle in special slaughter-houses, rather than send them to the public market or the packing-houses which it virtually incloses. Who affects to believe this, may be awarded the palm for simplicity and credulity.

It is much more in keeping with the nature of things and the ascertained temper of their owners, to conclude that many of these cattle, from infected stables, went through the Chicago stock-yards into the adjacent abattoirs, or to our eastern markets, and came into more or less direct contact with the stock-cattle going into the dairy and farm herds, east and west. In doing so they necessarily infected yards and cars, so that it is impossible to say to-day where the living plague infection has been planted and where it has not.

If we are asked where is the evidence of this in the presence of disease in different districts. I answer where was the evidence in the east in 1878, when representative men expressed the most absolute confidence in the soundness of the dairy herds in our eastern cities? Where was the evidence of its existence in the Mississippi Valley in 1884, when five different States had for a year harbored the infection in their most carefully tended and closely watched

herds? Where is the evidence of the disease in the city of Chicago in 1885?

An infection so slow and insidious is often not recognized for months or a year by the stock-owner, unless he has had a sad experience with it already. And it will not surprise me to find the plague in many new localities, east and west, in the next few years, places infected by cattle from Chicago, and others infected from similar sources to that of the Chicago outbreak itself.

Much misapprehension exists as to the nature of this lung plague; I recently saw in a Denver, Colorado, stock journal, a statement to the effect that if a given outbreak had been lung plague, half the herd would have been dead in eight days. Now the most characteristic feature of lung plague is its slow development, its tardy extension through a herd, and the delay of the resulting death.

I am sometimes tempted to divide infections into two great classes — the honest and the hypocritical. Of the honest infections one of the best examples would be the rinderpest, which develops two days after infection and kills its victim in two or three days more. There is no difficulty in dealing with such transparent integrity as this. No hypocrisy here, no cunning deceit, no hiding of the lion's fangs and claws under the donkey's skin. Any one may stamp out rinderpest and at small expense.

But lung plague is the impersonation of deceit, hypocrisy and double dealing. You buy an infected ox and for three or four months it appears sound. Then it has an illness, fatal or not. Then a month later one or two more sicken, and a month later still a few more. It disarms suspicion to all but the thoroughly initiated, and it lasts for years in a city or district without arousing the apprehension of the public at large.

Do you longer wonder that we hear nothing of other centers of infection? Next year or the next we are likely to be once again roused from our dream of security. God grant that the rousing to action may not come too late.*

After all our sad experience we turn to Congress to watch for the first signs of the dawn of a better day and we see, what! We see Mr. Springer, of Illinois, urging action on his reluctant colleagues, assuring them that, as the effect of the Chicago out-

*Since this was delivered the lung plague has been found at Buffalo, Tonawanda and Boston, in the line of the cattle traffic from Chicago.

break, Illinois alone has suffered a loss in the last year of at least $10,000,000. On the other side we see Mr. McAdoo, of New Jersey, blustering that he would rather see the last cow die, than break down the American Constitution by authorizing federal officers to act in this matter within State limits. Well and justly did his colleague, Mr. Hammond, draw the picture of the farmer coming in to his wife with: "Nancy, the last cow is dead; but thank God, Mr. McAdoo has saved the Constitution to us." Two other Congressmen, who by some mischance have obtained medical degrees, but who on the floor of the House manifest the most absolute ignorance of modern medicine, boldly allege that this lung plague, if it does exist, is pleuro-pneumonia and therefore not infectious, and that like small-pox it is born of filth and privation alone. Now, on the other hand, inflammation of the lungs and pleuræ — pleuro-pneumonia is a not uncommon manifestation of measles, of pulmonary consumption, of pulmonary actinomycosis and of pulmonary syphilis. According to their reasoning therefore no one of these is contagious. Lobular pneumonia in man and in the horse are to-day known as contagious diseases due to a bacterium (*pneumococcus*), but Doctors Swinburne and Gallinger have evidently never heard of such a thing. Small-pox, which Dr. Gallinger calls a purely filth disease, was unknown in Europe until the sixth century, when it was imported from its ancient home in the East. It spared Europe in her early savage and filthy age, but became her scourge in the succeeding ages of civilization and cleanliness. It spared Australia and Tasmania in spite of the degrading filth of the blackfellow, and the huddling uncleanliness on the emigrant vessels and at the "diggings." No physician of to-day, who has any regard for his reputation, would attribute a case of small-pox to anything else than infection. The history of lung plague is equally demonstrative. Unknown in the British Isles till 1839, it was then imported from Europe and has prevailed ever since, but still respects the purely breeding districts which none but the native cattle are allowed to enter. It is unknown in the Spanish peninsula which is out of the line of traffic and has no great manufacturing centers to draw cattle from the infected districts of Central Europe. Switzerland, Oldenburg, Schleswig, Denmark, Norway and Sweden, have each imported the infection, but stamped it out by rigid suppressive measures. Massachusetts imported the plague from

Holland in 1859, but stamped it out after six years active effort. Imported in Cape Town in 1854, in the body of an infected Dutch bull, it has ruined the cattle industry of all South Africa, and caused a great reduction of cattle, and a resort to sheep instead. Into Australia it was imported in an English cow in 1859, and has dwarfed the cattle industry of that great island, and has driven the colonists, as in South Africa, to the alternative of sheep. More than this, the preventive inoculation inaugurated by Willems in 1852, has been systematically adopted in South Africa and Australia, as the only protection against inevitable ruin, and there cattle are every year inoculated by the hundreds of thousands, the result being the production of the diseased process localized on the surface of the body, and the conferring of immunity from a future attack. There is no disease of man nor beast, the contagious nature of which is more thoroughly demonstrated than that of lung plague.

All this, and much more, is printed in the Congressional documents; in the reports of the treasury cattle commission, of the Department of Agriculture, and of the Bureau of Animal Industry, reports called for by Congress itself, yet our Congressmen are too indifferent to look at these pages, and in spite of the gravity of this great question, in spite of loss from this cause of $16,000,000 in the past eight years on our exports alone; in spite of the assurance of one of their own number that the State of Illinois alone had in the past year lost $10,000,000 in addition, they refuse an appropriation of $250,000 for the purpose of stamping out the infection, and arresting this great loss; and in place, they adopt an amendment of Dr. Swinburne's, providing for "the appointment of three medical doctors to ascertain whether this disease exists, and if so, whether it is contagious." Also, another amendment from the same source, providing "that no cattle shall be slaughtered under this act excepting for scientific investigation, by the above-named doctors."

Dr. Swinburne's amendment was adopted by a vote of 114 to 25.

A further suggestive commentary on the action of the two doctors, is furnished by the *Breeders' Gazette* of February third, in the shape of a letter from Dr. Gallinger to one of his New Hampshire constituents, promising to do all he can for the passage of the pleuro-pneumonia bill.

Is it not time that our Congress was called to task? We have perhaps the best form of government on the face of the earth; but in many of its practical workings it compares unfavorably with some others. The average Congressman has little realization of his position, as the custodian of a great trust. After he has done his (supposed) duty to his party, where he is ever your most humble and obsequious servant, he feels that his great duty to the nation has been achieved. He votes readily to make an investigation into this great alleged evil, but it is inconvenient to read the report, and next year he is as ready as before to vote an outlay for a new investigation. When finally a remedy for the evil is urged by a lobby kept in Washington at much expense to hold the representatives of the nation up to their duty, and a bill is introduced, they come up to its consideration with vacant minds, and in their ignorance, allow themselves to be swayed in any direction by the blatant assertions of any interested colleague. Is it not time that representatives were made to realize that they are there to do the work of the people? Is it not time that their constituents held them to their duty as representatives? Is it not time that Congressmen were returned under a solemn pledge to their constituents to advance certain matters of great national importance? Is it not time that you sent your lobbyist, who understands the country's need and who can be trusted to work for it, directly to the House, there to help along the cause by word and vote, rather than to send one man who will draw his $6,000 from the treasury fed by your taxes for doing nothing, and then pay another man out of your own private purse to stay in Washington to urge him to right action? Is it not time that representatives who have made pledges in regard to such important matters should be called to speedy account, and be dispossessed of their seats and be held as criminals besides? The business defaulter is not allowed to go unpunished. If he were, the foundations of all commercial trust were at an end. Is it any more safe to leave the most vital interests of the people to an irresponsible representative who feels independent even of those who sent him as their delegate? Depend upon it, so long as the present state of politics continues, you will find on the floor of our legislative chambers, many lazy adventurers, who require to be goaded to do their duty, and not a few who are ready to barter the most important interests of this great people for a mess of pottage.

A year ago a "Farmers' Institute" meeting in this place adopted a resolution petitioning Congress to pass effective laws for the extermination of lung plague. We can now see with what success. Doubtless our petition was, along with thousands of others of the same kind, decorously bestowed in the waste paper basket, and there its influence ended.

You may pursue the same course till doomsday with about equal effect. To succeed, you must make your action more radical. You must secure from your proposed representative a solemn pledge to work faithfully and earnestly for this and other important reforms before you consent to vote for him; and you must afterwards hold him to the strictest account as to how he has fulfilled his trust.

I would urge an act to disfranchise a man who would prove recreant to such a pledge, just as I would he who as a candidate would use or authorize the use of money or its equivalent to secure a vote. This is no place to talk politics, but unless you purify politics at their fountains, and return patriots instead of place-hunters, you will find that Pluto will rule in the Capitol, and that your interests as the American people at large will be in the main neglected and ignored.

The enemies of legislation for the extinction of animal plagues are not all to be found in the great live stock exchanges and on the floor of Congress. Many otherwise respectable newspapers are the humble sycophants of these rings in this matter, and lose no opportunity of retailing the most wholesale untruths and vilest slanders, concerning the veterinary servants of the government and veterinarians in general. They act on the principle that if plenty of mud is thrown, some will stick. As I am neither a place-holder nor a place-seeker, I can speak without bias in this matter. While most of the attacks are mere general slanders, with nothing in them that can be put to proof, a few have actually been definite and in all such cases that I have been able to investigate, I have found the veterinarians absolutely right, and the newspapers absolutely wrong. The barefacedness of the falsehoods retailed pass all comprehension. The Chief of the Bureau of Animal Industry was charged with originating the report of foot and mouth disease in Kansas. The truth is that on going there to investigate, he at once pronounced it to be simple gangrene from ergot. The Bureau of Animal Industry was charged with starting a report of lung

plague in Columbia county, N. Y. The truth is that the *Chatham Courier* started the report, and I, visiting the place for this State, at once decided it was anthrax. I might quote such cases by the dozen, but their disproof is of no avail; "destroy his fib and sophistry in vain; the creature's at his dirty work again."

The same spirit is very manifest in Congress, and I fear is in both instances inspired from the same source, the *Live Stock* exchanges. These are made up of able and far-seeing men, and they are satisfied that if they can sufficiently discredit the veterinarians, upon whom all practical work of veterinary sanitation must finally devolve, they will thereby insure that no bill shall pass Congress which will seriously interfere with their private interests. Hence all legislation hitherto secured has left the Bureau of Animal Industry bound hand and foot and utterly helpless to do any effective work of extermination. Every one interested in live stock has seen the folly of the restrictions imposed, and an attempt has been made in the present Congress to secure some relief. To obviate this, one of the shrewdest possible moves was made. A bill conceived at Chicago, and introduced by Senator Miller, gave promise on the face of it of securing much fuller powers than had been thought of for the Bureau of Animal Industry, and provided that three men of business should be appointed as commissioners to carry it into effect. Most of my friends and coworkers have been captivated by this bill and its adoption has been urged from all over the west and north-west. They have failed altogether to see the poison insidiously instilled in the intrusting of the work to three non-professional men who know nothing or next to nothing of the diseases of animals. Under the guise of a desire for a strong measure, this bill has succeeded as fully as its instigators could have wished, in still further discrediting the veterinarians as unfit to carry out such a work, and in doing so has dealt a heavy and effective blow at all veterinary sanitary administration.

Whoever may be placed in nominal charge of this work of extermination, the real decision as to available measures must be made by the expert who, knowing all the forms and phases of the disease to be controlled, is thereby enabled to close up every avenue of escape and to secure its destruction without any undue interference with personal property or the course of trade. The non-professional commissioners must either advance blindly or

they must call in veterinarians and consult with them before resorting to active measures. Again they must employ veterinarians to do the actual work of expert examinations. Their whole work is, therefore, finally made to rest on the skill and integrity of the veterinarian. If disposed to be false he can act thus as subaltern as well as if chief. If lacking in skill, it will issue in evil as much in the one position as in the other. The Miller bill appears, when viewed beneath the surface, as an attempt to throw discredit on the veterinary profession, and as such it has accomplished all the evil that its shrewdest projector could wish. Its advocates knew that it could not possibly pass this session, but steadily pushed it onward to the detriment of the Animal Industry bill, and the cunning enemies who inspired its evil provisions can now rejoice in its fruit in the thorough emasculation of the Animal Industry bill, and the robbing the bureau of what little power for sanitary work it has hitherto possessed. The Bureau of Animal Industry is the proper channel through which the Federal government should operate in such a matter as this, and it may be safely concluded that any attempt to transfer its proper work, to other and especially to unprofessional hands, will discredit not the bureau alone but the work as well.

The only tangible arguments for appointing a commission of business men appear to be the following:

First. It puts too much power in the hands of one man.

Second. Veterinarians are not worthy of confidence.

Third. An animal or a herd of extra value should not be at the mercy of a veterinarian.

First. The argument might avail to secure the appointment of one or two more experts, but it is difficult to see how it will sustain the appointment of business men. If the work demands knowledge and skill of a special kind, those should be appointed who are possessed of such special skill and knowledge. If we want a commander for a belligerent army or navy, we naturally turn our eyes to the graduates of West Point and Annapolis, rather than to the bank counter, or the manufacturer's office. If we want to check the advance of yellow fever or cholera, we look to the graduates of medical schools, rather than to the owners of mines or factories. But it seems that in the case of an animal plague, the expert is to be excluded as dangerous, and that ignorance of the subject to be dealt with is a special recommendation. Then,

as regards the relative efficiency of one or of several heads, and as to the sacredness of the trust in the two cases. What would be thought of an army being sent into the field under three commanders, no one of whom could act without the concurrence of the other two? The delays and uncertainties attendant on their consultations and disputations would give a prompt and active enemy the advantage of every step, and much more would this be the result in the case of our invisible bacteridian enemy, who is increasing his legions in a constant geometrical ratio with every hour of our delay. Then, as to responsibility and trust. It is a proverb that "corporations have no souls," that the sense of responsibility is lessened in ratio with the number on which it rests, and that to secure a reliable officer, that officer must be made to feel that the responsibility for his work rests on him alone.

Second. The assertion that we lack the requisite education in the great mass of our veterinarians, is to a certain extent, true. We have many so-called veterinarians, practicing without having taken the requisite preliminary study, and many of them without degrees. But we have many physicians who are no better. Is the cure for this the repudiation of all physicians and veterinarians? Because a certain number of physicians and veterinarians are such only in name, and are not experts, therefore, let us discard all medicine, and consult the banker, the lawyer, the trader, the manufacturer, the miner? Is this supposed to be an argument?

It is quite true that our government, and our colleges founded on federal appropriations for the advancement of education in subjects pertaining to agriculture, have failed to equip one good and sufficient veterinary college in the whole land. They have left the education of the veterinarian to colleges that live upon their fees, and that are consequently tempted to hurry the students through at the expense of lack of thoroughness. Are we, therefore, to thrust aside those who have been more thoroughly educated, and install as directors those who know nothing of the subject? It would seem as if this were the wisdom of our Senators and Representatives. In our system of education for the advancement of agriculture, we have neglected that which is calculated to preserve that branch of agricultural industry, which can alone secure permanent fertility to our soil — our live stock — and when the stock thus neglected is threatened with wholesale destruction, we declare

that we shall have nothing to do with the expert who has secured an education in spite of our neglect, but shall intrust the whole subject to three bankers, traders or politicians.

Third. The third is doubtless the most potent of all with many minds. If I own an animal worth $1,000, I can not stand by and complacently see that destroyed on the word of a veterinarian. Here at last we reach the kernel of the nut. Three business men are to be empowered to save the $1,000 animal, no matter if she has the lung plague. The $20,000 herd must not be sacrificed for the protection of the country. This is the real argument stripped of its verbiage. The poor scrub stock may be slaughtered without mercy, the good of the country demands that, but the valuable herd — oh, no! The destruction of that would be a very serious infringment of the rights of the citizens; the veterinarian can not be allowed to decree this. The expert's skill must here count for nothing; the commissioner who makes no claim to such skill may overrule his diagnosis and pronounce the disease non-contagious if, in his judgment, the sacrifice is too great. The hope of the extinction of the infection must be deferred or abandoned at the instance of those commissioners who are appointed and paid to secure such extinction.

If otherwise; if the commissioners are merely to secure further and conclusive testimony in the case of the valuable animals or herd where are they to find such testimony if not in the ranks of the veterinary profession? Surely the nation can afford to secure at the outset the best veterinary talent that the country affords; and is not the right of the poor milkman in his scrub cow, just as inviolable as that of the millionaire in his $2,000 Jersey? To the latter the loss is often a sentimental one while to the former it is his whole source of livelihood.

NOTE.— It is a matter of thankfulness that Congress in the last hours of its existence made some atonement for its folly by appropriating $500,000, and authorizing the commissioner of agriculture to use any part of this "in such manner as he may think best to prevent the spread of pleuro-pneumonia, and for this purpose to employ as many persons as he may deem necessary, and to expend any part of the same in the purchase and destruction of diseased and exposed animals, and the quarantine of the same whenever in his judgment it is essential to prevent the spread of pleuro-pneumonia from one State into another."

The most serious drawbacks to this measure are the absence of any authority to take possession of diseased cattle and destroy them if the owner objects, the absence of any prescribed means for arriving at a proper valuation for purchase, and the uncertainty as to the right to act within a State so long as it can be plausibly argued that there is no imminent danger to any other State. On the whole, however, it is a great improvement on previous legislation, and it is to be hoped that through hearty coöperation of State officials its most serious drawbacks may be successfully overcome.

Breeding Dairy Cattle.

Delivered at Oswego Institute,
By Major HENRY E. ALVORD,
Massachusetts Agricultural College.

Mr. Chairman, Ladies and Gentlemen.—In the title of the subject assigned (although not of my choosing) I rejoice to see that word "breeding," believing firmly that the only way in which we can have good dairy cattle is by breeding them. A good, satisfactory, home-bred herd, in contradistinction to those bred more or less at haphazard, is the foundation of success in dairying and with dairy stock. Let us understand when we say breeding, it means two things. The blood of the animal descended through known lines of merit and the care of that animal from the day of its birth. The farmer who thinks his young stock will take care of themselves and doesn't give to the animals much attention or food until they can make return to him, is liable to have but half a dairy cow where he might have had a whole one, if he had begun early enough to take care of it. Breeding is half in the blood and half in the care. Then to get the stock he must breed them himself or pay somebody else for doing it. The purchase of a herd, judging simply upon the individual indications of the animals, is a very hazardous undertaking and much more liable to result in loss than profit.

And it is dairy cattle which we are asked to consider. The foundation from which our domestic cattle have come was not dairy stock. The dairy cow is an artificial product, the result of man's work, largely. If we go back to the original native cow, so to speak, we find an animal able, after the production of a calf, to give but just enough milk to sustain that calf until it can derive its sustenance otherwise, and then gaining sufficient flesh during the remainder of the season to carry her through the next winter to produce another calf in the spring. Meanwhile she draws largely upon her reserve or accumulation of flesh and fat, coming out in

the spring just alive enough to begin this work again. Man, taking this for the foundation, has so directed the reproduction and so managed the work that we have two classes of stock, entirely distinct in their appearance and in their purposes, which we classify as beef stock and dairy stock. We know very well the characteristics of each. It is not worth while to stop and and dwell upon them in detail now. They could not be very much more unlike, and both belong to the horned cattle division of the animal kingdom. A description of one will in no case fit the other, especially if that description deal with the temperament of the animal; one of them being of a phlegmatic temperament, while the other is of a highly nervous disposition. Occurrences which will not in the least disturb a steer or beef cow, like a thunder storm, worrying by a dog, or any sudden alarm, would have a lasting effect upon the dairy animal. These two classes of animals are just as distinct from each other as the heavy draft horse of Clyde, is from the English hunter or racehorse. When any one talks about combining these two classes and getting a satisfactory result from the mingling of them, it is an absurdity upon its face, and when you hear glorification of "the general purpose cow," it is a delusion and a snare. There is no such thing. There can be no such thing in this age of specialties. We must have one thing or the other; and so I will take the topic as meaning specifically dairy cattle.

Before we proceed further, we must determine what line of dairying we are going to take up. It is upon the decision of the uses to be made of our dairy stock, that we must decide how to select the breed and manage them. Of course, by dairy stock, or dairy cattle, I mean those that produce milk. Milk is to be used in three general directions. First, in its natural state, for consumption as food; second, for making cheese, and third, for making butter. The decision should be fully made as to which of these three purposes the milk produced is to be applied, before we can attempt intelligently to select our stock. Without going into detail here, it is perhaps sufficient to say that we find very great differences in the milk produced by different cows, especially in the different breeds of dairy cattle. Some milk is adapted to one line of use, and some to another line. Hence we must study the milk, and determine whether it suits our wants or not.

First and foremost in the matter of milk, we should recognize

that it is not an article of drink, but an article of food. It is valuable, and its value should be estimated, not from the seven-eighths of its bulk, which is water, but from the remaining eighth, which is solids. It is the solid part of milk only that is of value to us, and other things being equal, unless it is simply quantity, that we are seeking and not quality, that milk is the best which gives us the greatest amount of food, or solid matter, to a given quantity, say 100 pounds. Again, we find milk differs wonderfully in its physical composition or character, and that while the cheesy, curdy matter is much alike in different milks, the other parts, and particularly the fat matter, varies remarkably. Not only in its proportion to the whole amount of milk, but in the physical condition in which this fat is mingled or held in suspension in the mass of the fluid that we call milk. The fat of milk is found to be in very minute globules of which it takes three or four thousand, ranged side by side to measure an inch in length, and from that increasing in size and diameter until the globules are so large that 1,500 or 1,800 of them make an inch in length. We have this variation in the size of milk globules or fat globules in milk, and this should be considered in determining what it is best adapted for. If we want milk to sell, if we are unfortunately so situated that the quality is not regarded but merely quantity, then we should attempt the production of milk which would barely reach the legal standard of quality. For this purpose the solid matter must rise in this State to about one-eighth or twelve per cent, although it is thirteen per cent in some States. In this case, if the milk is to be transported long distances or even to be carried about the streets of a village or city, for delivery, we should seek animals producing milk the fat of which is in the finest globules or particles, evenly distributed through the mass, so as not to separate readily from the milk. The smaller the globules, the evener it is distributed through the milk and the longer it is separating, and the better it will bear carrying to market. But if our object is quality as well as quantity, then we must seek those animals which will give a large per cent of solids, also a large per cent of fat in the milk, but still in such form that the milk will bear transportation well. If our milk is to be used for making cheese we certainly want milk that will give us the greatest number of pounds of cheese to the hundred pounds of milk. I have already said that the cheesy portion of milk is pretty near a fixed quantity. In 100 pounds of healthy milk you

will find just about so much caseine, but this differs in its character with the milk of the different breeds of cows. It also differs in the economy in which it can be manufactured into cheese.

We may say, generally speaking, that milk which is good for butter-making is good for cheese, though it is *not* true that milk which is good for cheese is always good for butter-making purposes. Stock may be selected whose milk will be of great amount and most economical for cheese-making, which will not be at all adapted to butter-making. If we wish to produce butter, it is economy to get those animals which will produce such fluid as will give us the greatest amount of butter from the least quantity of milk. The richest milk is what we want for butter-making. Rich in its solids, and especially rich in its proportion of fat. An animal which will give us milk, of which seven or eight quarts will make a pound of butter, is far better adapted to butter-making than an animal which will give much more milk, but milk which will require twelve or thirteen quarts to make a pound of butter. So we must watch carefully, for the cow that will give us nine or ten thousand pounds of milk in a year, may be decidedly less profitable, in a butter dairy, than another cow that will give only five or six thousand pounds in the same time. Again, that milk is better, for butter-making purposes, from which the cream separates easily and quickly. That is the case when the globules are large, of the largest size. While it is difficult to examine milk in bulk and determine whether the globules are large or small, you can tell easily when the cream on the milk forms quickly. This rapid cream "rising"—as we call it—indicates large globules, and that it is good milk for butter-making. Milk from a rich butter-making cow often shows a collection of butter at the top of the pail even before it is strained.

If we want milk for sale or for cheese, large production and small globules, it is the best policy to select cows that through a long line of generations have been bred for, and now are noted for, just those qualities. By way of specification, the Ayrshire, Holstein-Friesian and Short-horn—any of these. If we want milk especially for cheese-making, we want a large percentage of the solid contents of the milk. To produce a reasonable quantity, rich in solids, I would look to the Ayrshire and Short-horn, as well as the Devon (which is not appreciated in this country), and the Swiss cow, which is comparatively unknown as yet. If we

want especially butter-making qualities, we have to select a cow which gives from the least quantity of milk the greatest proportion of butter fat — in large globules — that separate easily and make butter of a high quality. To get these we must select from stock which has been especially bred through long years for this object. For this purpose nothing compares with the cattle of the Channel Islands — Guernseys or Jerseys.

If you call to mind a model dairy cow, or give a good description of one and omit the two points of color and size, that description will apply just as well to an Aryshire as to a Guernsey, just as well to a Holstein as to a Jersey. The pure-bred milch cow is an animal type, confined to no one breed. The dairy cow has something about her which is fixed, in this capacity for producing milk and which necessarily assigns her to a distinct class of cattle. But don't let me be understood as insisting upon pure-bred stock. Pure blood is by no means necessary to dairying. Grade stock usually does fully as well. It is, however, to the pure-bred stock that we must look with certainty for a reproduction of the animals which we want. I believe we have in the native cows of this country the very best foundation with constitution and general capacity for building up profitable dairy herds by the use of pure-bred males. They should be carefully selected and from a line of ancestors noted for dairy purposes and for the special dairy purpose desired. If we choose to cross breeds, or breed grades, then I think there is no doubt, it can not be laid down as a rule, but is certainly indicated, and a probability, that we may depend upon generally getting the quality in our milk product, from the male side, and the shape and character of the animal, with capacity and quantity of production in the cow, from the female side.

With these general remarks, somewhat rambling I fear, I have tried to show the principles on which, personally, I should go to work to select and build up a dairy herd.

Q. Will large or small cows produce milk, butter and cheese most economically. And why?

Mr. POWELL, Syracuse.—From various experiments that have been tried in various countries it has been demonstrated that cattle do not consume food in proportion to their size. I think that is generally accepted. Of course then comes up the question whether large or small cows produce the most. While animals do not consume food in proportion to their size, certain animals use

the food for one purpose, while others use it for another. A cow is nothing but a machine, and the question to decide is, which is the best machine. Too large animals show a tendency to run to bone or flesh. Too small ones show a want of assimilation of food. My opinion is that a well developed, medium sized animal of any breed will prove to be the most profitable.

Q. By what means is the dairyman to judge of the value of his cows?

Mr. POWELL, Syracuse. — That is a very important question, one that ought to be thoroughly discussed and considered, and should occupy more time than I can possibly give it now. That is a subject to which I have given considerable thought for the last twelve years. I doubt if there are half a dozen farmers here who can accurately tell which are their paying cows. The first thing to get is a pair of scales; hang them in the stable and a black-board or ruled paper by their side, so you can keep account with each cow all through the season. If you stop with a few days or weeks it is likely to mislead. The starting point is to find out what the cows are doing. There is no way to do this except by testing them both for milk and butter. By this means you know whether they are paying cows or not. There is no guess-work about a pair of scales.

Winter Butter Making.

Read at Lockport Institute,
By Professor L. B. ARNOLD,
Of Rochester.

I am here to speak of winter butter making in Western New York. Winter butter making is worthy of more attention, for unless the producer happens to live so near a city or village that he can deliver it for direct consumption, if milk is produced in the winter it must be made into butter to be profitable. I am aware that there is but very little butter made, very little dairying of any kind carried on, in this section; but I think it would be an advantage if more was done, notwithstanding this is an excellent fruit and grain-growing country. A little dairying mixed in would be more profitable than the cultivation of so much grain or of fruit even, because butter is now, and is likely to continue to be for some time, a better paying product than either grain or fruit will average. The price for butter to-day is better than that of any other of the ordinary agricultural products; and the fact that the consumption will increase, with the increase of population, now rapidly increasing and with the decrease of imitation dairy products, we are not likely to overtake the demand for *nice* butter. There is butter in plenty to supply the demand for an ordinary or inferior quality, you can get all the oleomargarine you wish, but you can not get a supply of fine butter very easily. The progress toward developing fine quality is necessarily slow. It is a matter not of climate or soil or water altogether, it is a matter of thought and experience and close attention; it is brains and education in the dairy that must give success, and this work is slow. When a man devotes most all of his energies to manual labor and works in the field all day it exhausts his vital forces through his muscles, and he feels no inclination to expend any energy through his brain. When a man has exercised until he is tired out he feels as though he would rather lie down and sleep and regain

what vital energy has been carried off through his muscles than exercise his brain in thinking. When he is tired out he simply can not do it. For that reason laborers think slowly, and farmers are slow to take up anything that requires constant thought, attention and care. It is only those who expend more energy through their brain and less through muscle that are going to make an advance and keep at the head of making fine dairy products, or fine anything else for that matter. For that reason we are not likely to have an excess of fine butter, over the demand, for a good while. It is safe, therefore, as a more profitable line of industry for the progressive farmer, even in this section, to engage in dairying, and unless it should cost us fifty per cent more to produce milk, it would be more profitable to dairy in the winter than in the summer, because both milk and butter are worth fifty per cent more. But there are objections I know; one of these is that it costs more. A man must have buildings especially adapted to it. They must be more comfortable and warmer than ordinary buildings. Cows can not endure the cold of winter, can not endure the exposure that they get if left out, and give a large flow of milk. The cow is tender and delicate and nervous; she is easily influenced by outside conditions; she is especially sensitive to cold. It is unprofitable to attempt to milk a cow when she is suffering from cold. It is a losing business for a man to winter any stock in such condition that a cow would suffer when giving milk. It is better to build tight buildings with enough fresh air to keep them good and healthy; let it be warm in the building; it is better to do this with any stock whatever; I wont say it is just as important with other stock as it would be for a cow, because other stock may endure discomforts with less disturbance physically than a cow; but it will pay even for young stock to be kept warm, instead of suffering with the cold, and the man who so fits his buildings as to make his cows comfortable in the winter, will be doing just exactly what he ought to do and what he should not neglect to do in caring for other stock. So the objection on the score of buildings does not, in my estimation, amount to anything. I have heard the objection that if we didn't keep our cows giving milk in winter, we could feed them on coarser food and at less expense. That is not a forcible objection. A man has no business to feed his cows on what wont sustain them. It is the practice of feeding cows on the refuse of the farm that makes so many scrubs. No man ought to feed his stock

on what will not sustain them. Unless you give food that will do that, your cows will run down and come out spring-poor. If you give coarse fodder, they must have something to balance up or lose flesh. While you are about it you might as well give them enough to have them producing milk freely as to have them doing less. The difference in the cost is but a mere trifle. Of course, it costs more to keep cows in winter than in summer, but that difference exists whether giving milk or not. The only real difference is in the cost of the extra food required to make the milk in winter as compared with the extra food required to make the same milk in summer. Suppose it costs ten dollars to keep a cow on grass during the summer without giving milk, and the extra food used for supplying the milk would be fifty per cent more, or fifteen dollars. That is about the proportion in which food is converted into milk as compared with what is required to support the body. That would be five dollars extra for the food consumed in summer for making milk. Well, now in winter it is going to cost more. It would cost say sixteen dollars for food for a cow giving no milk, add fifty per cent more for extra feed to give milk. That would be twenty-four dollars. That would be eight dollars extra for milk production in the winter, and five dollars for milk production in summer. The difference would be only three dollars more for winter than summer production. So there is not the difference that people generally suppose, and when you take into consideration the extra value of that milk, it seems to me an error for farmers to let such an opportunity pass merely from force of habit.

Then again it is objected that it takes more labor, because cows require more care in winter than they do in summer. It is said cows in summer help themselves, they gather their own food, and get their own drink, that they stable themselves under the shade trees, and fight their own flies and get along very well. Whereas in winter they have got to be housed and fed and cared for. These objectors seem to forget, that they have got to be fed and cared for whether they are giving milk or not. There is but very little difference between taking care of those giving milk and those that do not. They may require a little more feed and drink and perhaps to be fed oftener, but this is not much. Dairying *must run into the winter*, if you start in the summer, because a cow does not stop her milk at the approach of winter. She ought not to be dry more than one or two months in the year. So there is nothing that

weighs seriously against dairying in the winter, instead there is often an advantage in it. It costs less for the same labor in winter than summer, because labor is cheaper. To divide the labor of the farm and to do all the work that you can in the winter instead of crowding as much as you can into one season, when that season has already enough to call for the whole exertion of the farmer is the height of wisdom. This division of labor is a very important question. It saves them from that extreme exhaustion which shortens so many farmers' days, and particularly shortens the days of the farmer's wife, who has the dairies to take care of, while the husband and male help are forced to be out in the field. In the winter the men can do the work, and they ought to do it.

Dairying in the winter is merely a matter of habit. When you come right down to the matter of the facts connected with it, it is far more profitable to make butter in the winter than it is in summer, even here. There is some objection that you are getting into the creamery system, coöperative system of making butter, but when they gather the cream instead of the bulk of milk, the objection does not count much. The creamery business in this section is not likely to make any great deal of progress; there is not dairying enough to make it an object. There are in some localities not far from here, that would be called in Western New York, where creameries have been started and paid very handsomely. We have some men making winter butter in Western New York, and they are doing a splendid business; they are selling butter at twenty-nine to thirty cents a pound, and find ready sale for all they can make. These are the principal reasons and these are the principal facts that bear upon this subject of winter dairying. And there is plenty of room for more to engage in it, and a market for all the butter they can make, at prices that will pay much better than can be realized during the summer months.

Q. How long would you allow milk to stand for butter making?

Professor ARNOLD.— The longer it stands and remains sweet the better.

Q. Would you prefer to salt with brine or fine salt?

Professor ARNOLD.— The best method of salting is with brine, if you want to make a nice thing. The method of doing it is simply to churn at the ordinary temperature, say sixty degrees, until the butter has come enough to rise readily. Then turn in a gallon of cold brine for every fifteen gallons of contents of the

churn; agitate it slightly and the buttermilk will draw off like so much water. Then turn in as much *cold* water into the butter as will harden the butter, and it will form into granules and the buttermilk will separate. The next thing is to turn in some cold saturated brine, say at fifty to fifty-five degrees, and the butter will absorb the salt, and the brine standing on there will take out the last vestige of milk, and your butter will become saturated with brine and will be excellent, and not in the least greasy.

Warm Barns and Warm Water *versus* Food.

Address at Oswego Institute, March 2, 1887,
By J. S. WOODWARD, Secretary.
Of Lockport

Mr. Chairman, Ladies and Gentlemen.—We are a nation of Yankees, and the fundamental idea that a Yankee follows through life, is to make money. If he can make money, he is happy, even if in a desert. If he does not make money, he is unhappy, though living in a garden of roses. This idea of making money is legitimate, so long as made in an honorable way. It is not only legitimate, but praiseworthy. As farmers, it is our prerogative to make money. If we do not, there is something wrong somewhere. In order to make money, it is necessary that receipts be larger than expenses. When the farmer receives more than he pays out, it is assumed that he is making money, though this is not always the case.

If he sells from the farm the products, and receives for them more than it cost to raise them, and if by so doing he is robbing his farm of its fertility; if he is selling the requirements for profitable farming in the future, he may not be making any money. He may be only transferring wealth from the soil to his pocket. But in order to make money he must receive for the products sold more than the expense of production. It is not always necessary to increase receipts to make money. If we decrease our expenses; if we run the farm with less expenditure for labor, tools, wear and tear, and feed of our stock, it is equivalent to increasing our receipts.

If we go to the manufacturer driving his mills with ponderous and costly engines, and ask the greatest single item of expense in his business, the answer will be for the power to run the machinery. It will not be the first cost of the machine, nor the wear and tear, and the oil, but the coal which is burned to make the steam to run the machine with force

sufficient to do the intended work. A certain proportion of the fuel goes merely to keep up steam, and production comes only by the consumption of fuel beyond this amount. It is easy to see that if only sufficient fuel was put into the furnace to keep the steam only at a point sufficient to barely move the machinery, that all the money expended for fuel, as well as attendance, would be lost, and that in order to make money by running it, fuel must be added in excess of this amount. Now, whatever increases this proportion, decreases profitable production, and whatever makes this proportion less increases profitable production. What would you think of a man who should set up a costly engine on the street corner, or in the field, without a building to protect it from the fierce winds that come sweeping with a zero temperature for six months over lake and fields, to say nothing of the rains and the snows? There could be but one opinion, either that the man was a fool or did not know his business. But manufacturers are never so silly as this. They not only provide warm buildings, but they sheath the boilers, with heavy coats of some non-conducting material. They know full well the necessity of saving every pound of fuel possible, or of reducing to the lowest point the proportion of fuel used to merely run the machine. A few moments consideration, a little study of the physiology of the cow or any other animal, will show that no more delicate machinery was ever made than that by which we turn the productions of our farms into meat, milk, butter or wool. And it is just as true of the live machine, as of the engine, that a large part of the fuel (food) consumed goes to keep up steam (vital force) and to maintain a healthy temperature, and that production comes from the fuel (food) consumed in excess of this amount. In other words, in order to make a profit in keeping an animal, it must come from the production of milk or butter or cheese or some other product made from the food eaten in excess of the requirements of existence. In feeding an animal, a certain amount of the food goes to the maintenance of the system (running the machine), and a certain other amount to the maintenance of the temperature necessary for existence, and the latter is by far the larger amount under ordinary circumstances. It is possible to feed an animal just sufficient food to keep it without loss or gain, but this is merely running the machine, and all the food given is a positive loss.

It is found also that the animal is as injuriously affected by the cold, by winds and by storms as is the engine, and when it is remembered that at least four-fifths of a merely maintenance ration goes to sustain the temperature, the matter of protection from cold becomes of great importance.

There is another point: It is impossible for an animal to digest its food thoroughly, or to keep up a healthy condition of the system, with a bodily temperature less than ninety-eight degrees. Now, when an animal is in an atmosphere of about sixty degrees, the difference between that and ninety-eight is not very great; but when exposed to a zero temperature, the difference between that and ninety-eight is very great, and the radiation from every part of the body is very much more rapid than in the warmer atmosphere; and when below zero, and in a fierce wind, it becomes very much greater still; so it is possible for an animal to be in a temperature so cold that it can not digest and assimilate food enough to keep up its temperature and the wear and tear of the system besides, and it dies (freezes to death, we say). We have all read of the thousands of animals that have perished in the west, frozen to death; frozen because the animals were unable to keep up a supply of heat to withstand the temperature in which they were compelled to exist, and the result was death.

If it takes sixty per cent of the food eaten by an animal, in ordinary temperature, to keep warm, and if the proportion is greatly increased as the temperature is lowered, how foolish it is to keep cattle exposed to our winter temperature and attempt to keep them warm with extra food. The man who attempts it lacks wisdom, or else he has never considered the question in the light of dollars and cents, or profit and loss; if he does he certainly will not attempt a thing so foolish.

Now comes the question, how will this be obviated? There is only one way—that is by keeping them in warm quarters, and where they will not be exposed to currents of cold air. In other words, put them in warm, close barns. Don't think when talking in this way that I am a crank on the subject. It is a question of great importance to farmers; a question of comfort to the stock, and dollars and cents to the owners.

How warm should those barns be made? The temperature where any class of live stock is kept should never fall below fifty

degrees. It is very much cheaper to keep cattle warm with walls of boards, paper, stone, straw, sod or bricks, anything, I care not what, so that the cold and wind is excluded, than by the use of any kind of food. I am speaking from an experience of a good many years and I am sure that any one who will try the experiment will find the amount of food required very much reduced and the amount of gain very much increased in fattening or growing animals. Equally so of the milk and butter in the keeping of cows.

But if animals are to be warmly housed, it is very important that the air be kept pure by good ventilation. Impure air is as objectionable as cold, and even more so. The two great opposing forces then with which we have to contend are cold, and foul air. How shall we get rid of the latter without admitting the former? It will not do to ventilate by opening doors and windows. This will be sure to create draughts, and they are as dangerous to closely housed cattle as to humans. By far the best means of ventilation is by trunks or air shafts running from the stables out at the ridge of the barn. They should be at least eighteen inches square inside, and may be large enough to answer for chutes for throwing hay or other forage down to the cattle. In this case they should be provided with doors along the sides at varying heights. In any case they should be provided with slides or doors at the bottom, so that the amount of ventilation can be controlled, so that the temperature can be held as desired.

Cold water is as expensive as cold air. Whether we will or no, every drop of water drank by an animal must be raised to blood heat (98°), and the question to be decided is whether this shall be done by means of fuel before drank, or in the animal by means of food. The latter is a mighty expensive way; it is lifting at the short arm of the lever, and not only this, but it stops the digestive machinery while it is being done. Under no circumstances would I have the animal go outside to drink. It is a bad practice, as on some days many will not drink at all, and the following days, being abnormally thirsty, they drink a double quantity and are thus injured. My cows are watered in the stables with water about sixty degrees, and I am certain it pays. I think it would be better yet, were the water twenty degrees warmer. Prof. Roberts found, in some experiments made at Cornell, that giving cows water at eighty degrees saved fourteen per cent of the food over water

at forty degrees. This will certainly pay, as fourteen per cent is a good profit.

There is yet one point more to be considered. If cows are to be kept in warm barns how are they to get exercise, and how much do they need. The idea entertained that cows need to run out from two to four hours a day for exercise, is a relic of the ignorance of the past. There is not a shadow of sense in it. Either keep them in continually or let them out continually. This keeping them partly in and partly out is all wrong. There is a great deal of ignorance as to just how much exercise a cow does need. I don't believe more is necessary than she can get in the stable if properly fastened. I had a cow in my barn that was in there two years, and had never seen the outside of her stall, and a smoother, fatter, happier looking cow no man ever saw, and I never heard her find any fault that she didn't get exercise. If you are not up with the times, and think it absolutely necessary to give your cows exercise, do it in this way: Turn them out a few at a time, and follow them around at a brisk walk until exercised enough, and then return them to the stable. Another point in regard to this question of exercise should not be forgotton; every motion an animal makes, even to the switching of her tail, costs food. To move my arm causes an expenditure of muscle, an expenditure of vital force, vital energy furnished only by food; and so every time your animal takes a step, whether necessary or not, it is at an expense of money, and money out of *your* pocket. So this question of exercise is a question of dollars and cents. You must remember this, that every time you give your animals more exercise than is absolutely necessary it reduces your profit, it is done at the expense of your money. So now to go back to the money-making idea. If we would make the largest profit our production being the same, we must reduce expenses to the lowest point. This we can do in no way so effectually, so far as keeping our stock is concerned, as by closely and constantly housing our cattle in warm barns and giving them warm water to drink.

But beyond reducing our expenses, this course will certainly increase, with the same food, our production of milk, butter or meat, thus giving double incentive for trying the innovation. Will we do it? That is the question to decide.

So far, I have talked on a basis of dollars and cents, on a basis of making money, but there is a further and higher question that comes into this problem. Those animals are put into our charge by the

Creator, they are helplessly in our hands, and if we turn them out into the cold where they must suffer, or put them into cold barns, in either case causing intense misery, we are responsible to the Creator who will not hold us guiltless. To give them the very best possible condition of comfort is a moral obligation, whether it be profitable or not. If we don't do this, we are negligent of our duty. We have a higher duty in this matter than the matter of dollars and cents, but luckily what is our duty is for our interest as well, and sensible is he who takes good heed, and with prosperity shall he be rewarded.

Q. I would like to ask, if the gentleman would like his drinking water at sixty degrees?

Mr. WOODWARD.—I was unfortunate enough once to be placed in a country where the water we drank was never below eighty to eighty-five, oftentimes up to ninety. Until I got accustomed to it, I must say it wasn't quite as palatable as colder water, but after I once got accustomed to it, I enjoyed it much better than I ever did ice water; Professor Roberts says, that when they gave cattle water at forty degrees the average consumption per cow was about thirty-nine pounds, but when the cows got water at eighty degrees, they drank over ninety pounds, and continued to drink ninety pounds right along while having warm water, and with a constant increased production of milk.

Q. Would you keep breeding animals in close quarters?

Mr. WOODWARD.—If giving exercise, I would do so as quickly as possible, and then return them to the warm stable; we are breeding lambs, with the sheep in small pens, and they never get exercise beyond what they get in these pens, and healthier sheep could not be desired.

Mr. RICE, of Sodus.—I had business in Germany last year, and in the province of Hanover I found cattle standing constantly in the stable. They have very little pasture land, and they feed the cows in the stable. I also saw in North Germany, where they keep dairy cows in the stable, without moving, from November until the first of May, and a finer lot of cows I never saw.

Q. How do you tie your cattle in the stable?

Mr. WOODWARD.—We use a round pole running from the floor of the stable to the ceiling, just back of the manger. On this there is a ring which slips up and down readily, to which is attached a chain which goes around the neck of the animals. This

leaves them at liberty to lie down and get up, and lick themselves and get their feed in the manger, and at the same time they are more closely confined than if tied around the head. We have a little over three feet between each cow.

Q. In turning out cattle for a stated time each day — fifteen minutes — for water, in those days when the weather is not too inclement, will not the animal get accustomed to those fifteen minutes exercise without injurious effects to the animal?

Mr. WOODWARD. — Of course, to turn them out fifteen minutes is better than giving them no water at all; but the trouble is, first, the water is too cold, and then some drink and some do not. It is far better to water in the stable. If I were going to turn out cows to water, I would turn out one or two at a time, just long enough to drink, and put them back again, and turn out one or two more.

Q. How often do you consider it necessary to water cattle?

Mr. WOODWARD. — I suppose if cattle are watered but once a day they will live, but I should prefer to water twice at least; when they have water constantly in front of them, they will drink twenty times in the course of the day.

Q. I have some young stock put into the stable November 12th, have not been out since. If I continue to keep them there until spring, will they grow as well when turned out to pasture as those wintered in the usual way by going out to water and for exercise? They are fastened by the neck so as to be comfortable either when lying or standing.

Colonel CURTIS. — I have made a practice for a number of years of keeping my young stock in the stable the entire winter without turning them out at all. Within two days I made a personal examination of some heifers coming in next spring that have not been out of the stable since November, and I found them to be in fine condition, looking well in every respect, and I intend to keep them there until they go to pasture at least. I have tried this thing for a number of years and I am satisfied it is the best way, and they winter cheaper and in better condition than in any other way.

Q. Do you really think it possible that animals confined continually in the stanchions will do as well as when allowed their liberty a part of the time?

Mr. WOODWARD.—Certainly not; but why put them in stanchions at all? That is a barbarous method. The only sensible way is to fasten them by the neck, as I have just described, or in a similar way, or to put them in box-stalls, so they can put themselves into any position comfortable. But that when properly housed they will thrive better—be more healthy—I have proved by many years experience, and without a sick animal. And I ask any doubting Thomas to try this plan on a part of his herd, and thus be convinced that this is the better way.

Making and Saving Manures.

Delivered at the Batavia Institute,
By Prof. I. P. ROBERTS,
Of the Agricultural Department of Cornell University.

We all agree that our labors would be more pleasant and more remunerative if the soils were more fertile and productive. How to feed the plant is the one great problem to be solved by the farmers of New York. In order to solve it, we are forced to marry science to practice. They have been long courting with a view to uniting for mutual benefit, but the old musty professor on the one side, and the old rusty farmer on the other, have succeeded through ignorance and prejudice, back-biting and tale-bearing, in keeping these lovers apart, and so it happens that those who should have climbed helpfully hand in hand, have been having a regular monkey and parrot time of it. We come together to-day to unite in holy bonds, which shall never be dissolved, the sturdy boy, practice, of the farm, with the beautiful damsel, science, of the college, and their first duty shall be to learn how to till the soil and feed the plants; and they shall multiply and replenish the earth, and they shall have abundant offspring in golden dollars. We find in all parts of the habitable globe, the earth covered with plants. Some of them pigmies, others giants, but all furnishing food for the worm, the bug, the beetle and the higher vertebrate animals. These all use the plants for food, but the elements which they contain, they do not destroy but give back to their mother earth all they took from her, even to giving up their lives in order to pay the debt they owe. Those plants which are not needed for food are spread on the surface of the earth in the fall or early winter, there to protect their own or the roots of other plants, and there to decay so slowly that no perceptible heat appears, and hence no loss; and as fast as the smallest particles of the valuable elements contained in these plants become soluble the rains carry them into the soil to feed other plants; thus the cycles of years have rolled on and

the plants and animals have each used the food prepared for and made available to them by these processes over and over, ten thousand times without loss and without injury. More than this, every time these elements have been used by the plants they have become better and better fitted for the use and sustenance of the higher animals. May we not learn a valuable lesson from all this? After the earth had been fitted, man appears upon the scene, and all begins to change; he destroys the soil builders and cultivates in their stead plants of identically the same order but of a higher character; he harvests them and gathers them into barns, or sends them to the city, but fails to return to the soil all the valuable elements of which they are composed and the soil suffers. I have made this long preface in order to awaken an intelligent thought and I trust that it may be put to action. If we go from this institute back to our farms and continue depleting the land of its fertility, and wasting the manures of the farm we would better have toasted our shins by our fires and saved our expenses. As we must largely depend on farm manures to keep up the fertility of the land, the question is how shall we make them in largest supply. First, by feeding a large proportion of the plants raised on the farm to animals; second, by purchasing and feeding by-products, such as bran, oil meal and cotton-seed meal, which products should not be shipped out of the country but fed to our animals; third, by feeding liberally.

A ton of clover hay contains plant food valued at nearly nine dollars. If it is fed to a mixed lot of cattle the manure from feeding this hay would be worth ninety per cent of its original manurial value or in round numbers eight dollars. Can you afford to sell this hay and purchase commercial fertilizers? Would we not better feed the hay, save the manure, and then add some fertilizers and see if we can not raise the yield per acre of the cereals so that there will still be a good profit even at the low prices? Let our motto be, fertile lands and fewer acres of grain.

Take cotton-seed meal for another illustration. Compute its manurial elements at commercial values, a ton contains twenty-eight dollars worth of plant food. Fed as above, the manure would be worth twenty-five dollars and twenty cents.

The market price in car lots in Ithaca this winter was twenty-three dollars per ton. Cotton-seed meal is largely used in the manufacture of commercial fertilizers, and when we purchase

nitrogen in this form we pay seventeen to eighteen cents per pound for it. Would it not be better economy to pass this cotton-seed meal through the cows, instead of through phosphate manufacturers, and get the valuable and expensive plant food it contains for nothing?

Is it not time that we had a wedding on the farm, in order to unite science with practice?

Linseed meal makes nearly as good a showing as those products already mentioned. It costs twenty-five dollars per ton and the manure produced from feeding it, under the conditions named above, is valued at nineteen dollars and sixty-five cents.

Bran costs fifteen dollars per ton, and the manure from it as above is worth eleven dollars and seventy-five cents.

As the products I have mentioned vary somewhat in their composition, and as the values also of plant food may vary somewhat with locality, etc., let us deduct ten per cent from the values given above, in order to be on the safe side and to cover all possible contingencies, and we have the following:

Value of manure produced from feeding a ton of bran....	$10 55
Value of manure produced from feeding a ton of oil meal.	17 69
Value of manure produced from feeding a ton of cotton-seed meal.....	22 78
Value of manure produced from feeding a ton of clover hay.	7 20

With these facts before him can any man go home from this meeting and throw out nothing but a little straw, or what is nearly as poor, drought-cursed timothy hay, to his cattle while he watches the long line of cars pass by his door laden with their valuable products, which, paid for once, can be used twice in a single year and two thousand times over in the next thousand years without injury?

It is one thing to feed cattle so that they will produce something salable, and at the same time produce valuable barn manure, and it is quite another thing to save these products. I wonder how many of those who hear me are wasting one of the most valuable products of the farm, the manure.

A single inch of rain gives 100 tons of water per acre. Thirty-two inches of rain is the average fall at Ithaca per annum; this is 3,200 tons of water per acre per year. A barn-yard 100 by 110 feet contains almost exactly one-fourth of an acre. In one year on

this barn-yard falls 800 tons of water, to say nothing of that carried into it by the roofs of the adjoining barns. What becomes of all this water, you can guess as well as I.

An investigation conducted at the university, showed that every ton of water which passed through about one foot of untramped manure carried with it sixty cents worth of plant food. In an investigation of farm manures made under cover and which contained a liberal amount of straw it was found that a ton was worth three dollars and five cents in one case, and three dollars and sixty cents per ton in another case or an average of three dollars and thirty-two cents. Can you afford longer to leach the manure before it is carried to the field, or is it any wonder that some farmers think that farm manures are hardly worth saving?

Cows liberally fed and producing an average of nearly thirty pounds of milk per day also produced manure which showed a fertilizing value of sixteen cents in one case and fifteen cents in another case per cow per day. In brief, the manure from a liberally and profitably fed milch cow may be safely computed at one-half of the cost of the food she consumes. (This is based on present prices.) Cows weighing 1,000 pounds, liberally fed and watered, will make from three-fourths of a ton, to a ton of manure per month, and so far, our investigations go to show that it is worth at least three dollars per ton. You can easily multiply these figures by the number of animals kept and it will give you the value of the winter crop of manure. This is a very moderate figure and based on our recent experiments. During the present winter it was found that a lot of three cows fed four pounds of bran, four pounds of meal and twenty-nine pounds of hay per day produced almost one hundred pounds of solid and liquid droppings per day per cow. Let us see what a cow takes out of her food. Thirty pounds of milk, almost the exact amount given by the cows just referred to, contain between three and four cents worth of plant food. We will now see what amount of plant food is contained in the average ration of a cow in full milk. Four pounds of bran, four pounds of corn meal and thirty pounds of clover hay contain plant food according to recent analyses, valued at sixteen cents and eight mills. Deduct four cents, as the plant food carried off by the thirty pounds of milk, and it leaves the value of the solid and liquid droppings $.128. The ration above named would cost at present prices $.245, so it will be seen that the statement is not

exaggerated when I say that the value of the manure produced, by liberally fed cows, is equal to half the value of her ration.

How can we best save these valuable products of the farm? First and all the time, by stopping the cracks in the stable floor. Second, by abandoning the effort to make farm manures in an open barn-yard. Third, by hauling the manure direct from the stable to the fields, when it is possible, and always upon sod land. Since there is quite a portion of the year when this can not be done, or ought not to be, we must provide some suitable receptacle for holding and preserving it intact till such time as it may be applied to the soil most advantageously. The first step in preserving manure is to use plaster in the stables and on the mass wherever it is stored. The second is to prevent heating to that degree that will drive off the ammonia. Third, mix cow and horse manure, where possible, if it is to be stored. Fourth make the receptacle for holding the manure water-tight, and place it under cover. Fifth, absorb liquid manure with straw and bedding where it is abundant, and where it is not, use dry earth or a cistern to catch the liquids, but always add some plaster, unless the price is exorbitant, and here let me say, always apply manure where plants are growing, or where they will spring up immediately after the application is made.

Q. What proportion of the plant food in manure is in the liquids?

Professor ROBERTS.— About one-half.

Q. Is it not possible to make and keep manure in an open yard without loss of the fertilizing elements?

Professor ROBERTS.— No, it is not possible.

Q. Would not the custom of drawing manure every day out on to the open fields obviate the need and expense of covered manure cellars or yards?

Professor ROBERTS.— You can not always draw manure as fast as made; sometimes it is too muddy, and sometimes you should go to a farmers' institute.

Q. Will it not pay better to draw manure and apply it in fall, than to pile and cover it with muck to save ammonia, and thus make it more quickly available?

MR. MARKHAM.—As far as the productive result is concerned, I would say yes.

Professor ROBERTS.—Where there is a plant growing there is no danger of any appreciable amount of ammonia escaping; the

danger is, you leave it in the barn-yard and it gets hot, and then it very rapidly loses over one-half of the amount of its valuable nitrogen.

Q. Would you advise spreading manure in August, or any other month, when the sun is very hot and it dries very quickly?

Professor ROBERTS.—Yes, if it is fine enough to incorporate quickly with the surface soil; September, October and November are the best months in which to apply manure.

Q. Should the manurial value of the excrements, plus the value of the gain in weight of an animal, equal the value of the food; if the animal loses in weight should not the manure increase?

Professor ROBERTS.—Two and two make four every time; with the mineral elements of fertility, that is true every time.

Q. Have the manurial values of hay, clover, bran, oil meal, etc., as stated by Professor Roberts, ever been realized? In other words, have experiments ever been conducted to prove that the increase of crops derived from the application of these several articles, as mentioned, amounted to enough to pay for their application?

Professor ROBERTS.—No man can answer that question. We only know when we fertilize with these products, or the manure produced after feeding to animals, that the farm steadily increases in fertility. The best short answer to be given to the whole question is, I think, yes.

Q. "What can a farmer afford to pay for a load of stable manure?"

Mr. WOODWARD.—When we say a load of stable manure it is just about as definite as to say a lump of chalk. When a man gets a wagon load of wheat straw with a little manure in it, he says he has got a *load of manure*. The same with a *load of manure* that is three-fourths shavings. A load of manure from animals fed upon highly concentrated nitrogenous food is worth twenty times as much as either of these.

Colonel BOWEN.—Where I live, which is near the village of Medina, considerable manure is sold, and farmers are in the habit of going and getting this manure with a two-horse wagon, double box, at half a dollar a load. One of the most successful peach growers we have in Western New York has been buying this manure for years at half a dollar a load, and he has been very successful in its use. His land is a sandy loam, and he says that he couldn't do without the manure, and he gets a profit out of it.

Mr. DUTTON.— In the villages of Waterloo and Seneca Falls gardeners generally pay seventy-five cents a load, and draw it four or five, some of them eight miles. Sometimes they pay as high as a dollar a load for a double box.

Mr. WOODWARD.— This is well enough for men who do not know better, but if we only understood the principles of manure making as laid down by Professor Roberts we could buy the rich by-products, such as bran, oil meals, cotton-seed meal, etc., and by feeding them to stock under the proper conditions, make a manure very much richer than any we can buy, and make it without cost, or at most, for only a little labor.

Q. Is it advisable for farmers to use commercial fertilizers; if so, on what crops and to what extent?

Mr. WOODWARD.— As a supplement to barn manure, yes, if used with intelligence.

W. BROWN SMITH, of Syracuse.— I have used commercial fertilizers to only a limited extent. On some soils, particularly those light and sandy, the results were quite satisfactory; on others, particularly on a strong clay loam, I could not find where I put them.

Mr. FENNER.— I have used commercial fertilizers for the last fifteen years, and I can say unhesitatingly that I never invested a dollar in commercial fertilizers but it paid me from ten to fifty per cent profit. I endeavor first to make all the barn manure I can, and then supplement it with commercial manures, and the result has always been satisfactory.

Mr. WOODWARD.— I am a great advocate of commercial fertilizers, but by commercial fertilizer I would mean, as well, anything which we could buy and feed, the feeding of which would result in the making of manure. While I believe that on most soils and on many crops the use of such fertilizers as we purchase ready-made can be made profitable, and result in large crops, and be used much more largely than they are, I also believe that such foods as cotton-seed meal, linseed meal, bran and others rich in the elements of plant growth, are much better and cheaper as an agent of enriching our farms. Now, it is a fact that in a ton of oil meal bought for about twenty-five dollars, we get fertilizing elements which, if we went into the market and bought as chemicals, would cost over nineteen dollars. Now, if that is true — and it is true or else chemistry is false — it is very much cheaper to buy a ton

of oil meal and feed it to your stock and apply the manure resulting therefrom to the farm, than it is to go and pay twenty-five dollars for some brand of fertilizer containing no more fertility. If I buy the ton of fertilizer, and pay twenty-five dollars for it, I am just that money out. I have got to get back my twenty-five dollars before I am even, and all that I get out of its use for profit must come after that. Now, if I pay twenty-five dollars for a ton of oil meal, and I feed it to my stock and save the manure that I get from them and use it upon the soil, it is worth nineteen dollars, so that I have only to realize six dollars for its feeding value. It is a very poor farmer that can't make more than six dollars by feeding a ton of oil meal. A ton of bran costs about twelve dollars, and for feeding the crops is worth over eleven dollars. Now, I have only got to get one dollar as its feeding value for stock to get my money back when feeding it. I can feed both these so as easily to get back the first cost, and if the manure is all carefully saved and properly used upon the farm, we shall have a grand showing in the way of profits. So, while the use of some sort of fertilizer is a necessity on most farms, and the farmer had better buy and use the manufactured ones than go without, the best thing to do is to study this matter, provide the proper appliances and buy these waste products and manufacture, by judicious feeding, his own fertilizers and then use them in abundance.

Mr. FENNER, of Erie Co.— I want to tell you some results of an experiment made one spring in drilling bran with oats and barley at the rate of 250 pounds to the acre, side by side with the best superphosphates. The bran gave results equal to the superphosphate.

Jersey Cattle.

Read before the Farmers' Institute of the New York Society, Ithaca, February 17, 1887,

By E. H. LIBBY,
Of New York City.

I am not a Jersey dealer, I have no Jerseys to sell. It would not profit me a cent if I could inaugurate a Jersey boom. I frankly say that I don't know much about Jerseys. It has been my lot, however, to travel widely, and I have seen the "little Jersey" in great numbers, under all conditions, in their Channel Islands home, all over England and the United States, including Texas and the north-west, from the pet cow of the Jerseyman to the lowest Jersey grade on the American pastures. So I shall tread on somebody's toes now by telling you my conclusions, which you can take for what they are worth.

The animals of the earth, from man down, are largely the product of their surroundings. This is true of the Jersey cow. Land which must pay a rental of forty-five dollars per acre on the average, demands the highest culture. Such is Jersey. In her native home, the Jersey cow, like the Irish pig, "is the gintleman that pays the rint." The average twenty-acre farm of the Channel Islands is said, on good authority, to have six and one-half acres of roots and potatoes, three of grain, and ten of hay and pasture; the stock being two horses, six cows, six heifers, and eight pigs. Every rod of land and every beast must do its prettiest in the hand of the Jersey farmer. Rest assured that he will permit no animal to live that does not pay a profit. The European landlord system raises the rent as fast as improvements are made. So the more his land produces, the better his cows are, the more is the farmer incited to greater efforts perfecting his machinery for the turning out of gilt-edged butter and creamy cheese for the epicures of London. The law of selection and survival of the fittest, find in the Jersey farmer a most inexorable advocate. No scrub can live in his stable or waste the food of his pastures, and thus it has

been to a greater or less extent for centuries. For nearly 100 years no bovine animals have been imported into the Island of Jersey, and the agricultural societies have done their utmost by exhibitions and prizes to guide the breeder in the development of milk and butter qualities.

Nature has peculiarly favored the development of the Jersey cow as she is to-day. One February night, a few years ago, I sailed from Southampton. Going on deck of the little steamer early next morning, I seemed to be sailing into Paradise. The sea was smooth; a light, warm mist hung over the waters, and the rising sun tinted it with a purple glory. Through the haze loomed up the lazy, long-armed wind-mills above the soft outlines of the fair land. Gradually the mists lifted, and the island lay before us, stretching itself, and coming to life as a youth awakens on a warm spring morning. This was the Island of Jersey. Fair as a maiden, strong as a man in his prime, with the perfection of centuries of culture. Wandering over the rich pastures, we found the dark green grass ankle deep, and daisies blooming by the roadside. The sleek gazelle-eyed cows were everywhere, and in as fine condition as in our best pastures in June. Here, in these islands, we have conditions that exist nowhere else. A most fertile soil, upon isolated islands within easy reach of the greatest market of the world, a semi-tropical climate; a little nation separated to itself, devoted to agriculture through centuries of training, free from the excitements of politics, and with hardly a lawyer among its 30,000 people; and the Island of Guernsey, with 15,000 people, requires only two policemen to keep it in order. The money products of the islands are flowers, fruits, vegetables, and butter; with butter in the front rank. As nearly every family keeps its own cow, there is small demand for milk, so the milk is necessarily turned to butter, and butter qualities have been paramount with the Jersey breeder. As the Arabian takes his horse into his family, so these soft-eyed, fawn-colored bovine beauties have as much care and attention as the very children of the household; hence this gentleness which is so essential in the dairy and family cow. These conditions have made the Jersey cow what she is to-day.

And all the world has appreciated the fact, so that her progeny may now be found by hundreds and thousands in every land where good butter is eaten, and the family cow is an institution. It is

estimated that there are now in America 36,000 to 38,000 Jerseys of the breeding age. These are the animals which are registered in the herd books, and I suppose there are two or three times as many more of the grade stock. There are numerous records of Jersey cows giving 3,000 to 10,000 pounds of milk in a year, and it is claimed that the profitable Jersey should always yield 3,500 to 5,500 pounds per year. Yet quality and not quantity of milk is the basis of the claims of this breed. We all were astonished at the record of Mary Anne of St. Lambert, who produced thirty-six pounds twelve and a quarter ounces of butter in seven days, and whose milk required but six pounds ten and a half ounces to the pound of butter. And in mixed herds, records of a pound of butter to fifteen to twenty pounds of milk per the head are numerous. In one year the entire herd of Jersey cows at Houghton farm averaged 5,844 pounds of milk per each cow, which produced an average of 377 pounds of butter each, or more than a pound of butter a day the year through for each animal. I believe that I express the feeling of farmers generally, that forced tests of single animals are of no importance whatsoever in determining the value of a breed. The herd records are the only ones worthy of consideration, and I am happy to say that we have seen much less of these horse-race trials of single animals since the martyrdom of Mary Anne of St. Lambert. We have one record of a herd of nine cows, of six thoroughbreds and three grade Jerseys, which averaged 7,100 pounds of milk each and made 2,890 pounds of butter in a year. The cash income from this herd, including $243 in premiums, was $1,203 for the year or $134 per cow, the butter selling at thirty-five and a half cents per pound.

In comparison with these great records of the Jersey breed, every farmer knows what his own herd can do, and based on this standard he can easily determine the relative value of his herd and a herd of Jerseys. The whole point of these facts is simply this: They show what can be done by selection and careful breeding through a long series of years. They point to a standard of production and profit which every dairy farmer should work for, and must work for if he would keep up with the times.

Now, I am treading on delicate ground. I have seen many farmers with whom the name, "Jersey," was synonymous with "scrub," and from their experience they were justified in their opinion, to some extent at least. Why? The only answer is

found in the natural depravity of mankind, even including Jersey breeders. Because a cow is a Jersey, or a Guernsey, or a Holstein, is no proof that she is a good dairy machine. You must select a Jersey with the same care as you would select a native, although it is a strong point in her favor that she comes from a long line of valuable animals. When you hire a man for farm work you don't begin by asking him his name; but if you discover that he has good blood in him, you mark that as one point in his favor. Well, Jersey breeders on the Island of Jersey, in England and in America, have, many of them, been carried away by the high prices of the past, and they have brought the present depression upon themselves by not having enough force of character and long-sightedness to knock on the head the scrubs as soon as they were discovered. They have sold scrubs by hundreds and the whole breed has to suffer for this foolishness. They have squeezed too hard the goose that laid the golden egg. They have exhausted the soil of public demand, and the fertilizing by booms is now having its legitimate effect. They have bred for fancy points at the expense of milking qualities; they forgot that the place for the Jersey cow was the dairy, rather than the breeding pen. Just here is where the farmer and dairyman may come in to reap the benefit. The better class of Jersey breeders know these facts to be true and they are doing their utmost to cure the deplorable disease, yet the facts remain, the facts both for and against. The fact that the Jersey is *one* of the *best* of butter breeds, although there are many worthless animals having Jersey blood in their veins. It is the good animals that everybody wants, scrubs are worth nothing except to be killed. Now, every farmer, every dairyman, may improve his herd by an admixture of Jersey milk and Jersey blood, if he so desires. You can buy good Jersey bulls and good Jersey heifers at but a little more than the cost of natives. Think of a Jersey bull of good family selling for twenty-five dollars! You know that well-made butter from well-fed Jersey cows brings a higher price in the general market than the ordinary dairy product. There never has been a time when the butter product of America could so easily and cheaply be improved and raised in value beyond the point of competition with oleomargarine, and the cheap dairy grease called butter, than now. And I know of no more effective way of accomplishing this result and thereby adding millions of dollars

to the farmers' income, than by buying Jerseys at the prevailing low prices and breeding from them, and then *feeding your cows right and making your butter right.* I am speaking of buying as a dairyman, and at dairy prices and not as a breeder of fancy stock, at fancy prices. Nevertheless breeders need not lose heart, there is plenty of room for breeding Jerseys and an ample market for dairy animals at fair prices, and there will be so long as good butter is in demand. And who expects to see the market for *good butter* ever supplied?

Limestone, Lime and Plaster.

Read at Ithaca Institute,
By Dr. G. C. CALDWELL,
Of Cornell University.

These three familiar substances bear a certain relationship to each other in virtue of the lime that forms an important part of the first and the last, and makes up the whole of the other; they are also associated together in virtue of their real or supposed usefulness as applications to the soil. Lime is an absolutely necessary ingredient of the food of plants; and if this real or supposed usefulness consisted only in supplying this food, one of them would answer just as well as the other. But that they differ in their way of being useful, if useful at all, every observing farmer who has used them will readily allow. Looking upon the soil as a plant feeder, a few points may be first profitably noticed.

First. Every arable soil contains every one of the needed ingredients of the food of plants. For every soil worthy of being called arable will support some vegetation, without the addition of any manure. In so far, arable soils are alike; but they may differ: (*a.*) In respect to the quantity of plant food, as a whole, that they contain. (*b.*) In respect to the quantity of any one of the several necessary ingredients of that food that they contain. (*c.*) In respect to the readiness with which they yield up, any one or several of these ingredients to the crops requiring them.

Second. While ordinarily there is in every arable soil of usual quality a fair quantity of plant food, so much of it is insoluble, and, therefore, inaccessible for present feeding purposes, that the actual immediately available supply is cut down to a very low figure. That this available supply is below what a good crop requires, is proved by the almost universal necessity for manuring in order to make sure of good crops although the available plant food contained in a liberal dressing of manure is equal to but a small fraction of the quantity already in the soil to which it is

applied. For instance, we may expect to find in a fairly good soil .05 per cent, or five parts in 10,000 of phosphoric acid; while this is but a small percentage it means as much as 1,750 pounds in the soil of an acre to the depth of a foot. In ten tons of average stable manure applied to that acre we should have only about forty pounds of available phosphoric acid — less than a fortieth of what is already there. Of nitrogen in difficultly soluble and available forms we may have in the uppermost layer of a fairly good soil a foot thick from 6,000 to 8,000 pounds; ten tons of average stable manure will contain about ninety pounds of nitrogen, of which half may be as insoluble and unavailable for immediate use as that in the soil, leaving only perhaps forty-five or fifty pounds for the present crop. The acre's yield of Indian corn, seed and stalks together, requires about eighty pounds of nitrogen, of wheat, fifty pounds, of timothy, forty-five pounds and of potatoes forty-five pounds. No one could reasonably assume that all the nitrogen of a dressing of manure, or all the phosphoric acid, or any other ingredient of it is taken up at once, in the year that it is put on the soil; that even in many years it is not all taken up is shown by the experiments of Lawes and Gilbert; moreover we expect a dressing of manure to last more than one year.

This then is the state of the case: The manure that is ordinarily put on the soil does not yield to the crops such quantities of all the plant nutrients as the crops that we expect to produce on that manure will require. There are very large quantities of those same plant nutrients in every good soil, mostly locked up in difficultly soluble forms, which can be made useful if unlocked and set free; if our crops do not get all they need from the manure provided for them, they must make some use, whether we help them to do so or not, of this native soil-stock of food. Under these conditions, it is certainly reasonable to assume that a good deal can be done towards increasing the crops, if ways and means can be found for working over a moderate proportion each year of this large stock of native soil food into an available condition; and it is a plain proposition that if there are practicable ways of thus converting capital that is not paying good interest into a more rapidly profitable investment, it is a part of good farming to do so.

The materials that we apply to the soil for the purpose of increasing its yield are appropriately put into two classes, amendments and manures; manures are useful because of the plant food

that they contain; amendments are useful because they, in one way or another, improve the condition of the soil, thereby enabling it to produce larger crops; some materials in common use may act in both ways; but every one of them does its chief work in one way or the other—is chiefly a manure or a direct plant feeder, or chiefly an amendment.

Limestone, lime and plaster unquestionably belong to the class of amendments; or at any rate they are at least chiefly, if not wholly, amendments, so far as they are useful at all. To be sure they all contain lime, and lime is a very important ingredient of the food of plants; but there is usually if not most commonly an abundance of available lime in the soil for the largest crops that it is capable of yielding; and, moreover, these materials are most commonly used, when rightly used, in more or less direct connection with stable manure, which contains an abundance of lime.

What can be said for limestone as an amendment, or, also, for what is commonly called marl in this part of the country, and differs in composition but little from ground limestone? Farmers have of late been much urged to buy and use these materials, especially the former, and its claims have been supported by testimonials of remarkable results obtained by its use. I do not think that these claims are well founded, or that they are based on careful observation and repeated experiment; and, besides, ground limestone is not the kind of stuff to give remarkable results; it is altogether too mild in its actions to make all at once a great show in crops.

So far as we can reason the matter out, there are but two ways in which limesome can be useful; it may sweeten a sour soil; but how little farmers have to deal with such soils, made sour by an excess of vegetable matter decaying under unfavorable conditions. I would give it little credit for this; it may deserve more credit in another direction; there is all the time going on in soils where the conditions are right, a most useful process called nitrification, which consists in the conversion mostly of insoluble nitrogen compounds into the very soluble and very useful nitrates. Carbonate of lime or the fine ground limestone helps this process along, although we know little as to the precise value of this assistance. If I am not mistaken, ground limestone has found little favor with farmers, and not to spend time on an amendment of such doubtful value, I pass on to one of more certain action, lime.

The usefulness of lime as an application to the soil, under proper conditions, is unquestioned; and it may be safely asserted that the fundamental condition is that the soil shall contain a good supply of insoluble plant food, or else that the same shall be added with the lime. You all know the saying, that lime, without manure, makes the father rich but the children poor; the farmer who treats his soil in that way leaves it in an impoverished condition for those that come after him. The proverb expresses the general sentiment that lime is an amendment — not a manure or a direct plant-feeder, at least to any considerable extent. Lime acts upon the vegetable and animal remains in the soil that come from previous generations, or the stable manure applied, and also on the mineral matters of the original soil, in a way to liberate insoluble plant food; it acts in the same way on the stable manure that is used in connection with the lime, wherever lime is used as it should be. Its proper use seems to me, in every sense, a part of good, sensible farming. I see so little mention made of it in these days, in the agricultural papers, that I am led to think that liming is but little practised at present. If so, perhaps the extended use of commercial fertilizers has taken its place; and if this be so, it does not seem to me to be an altogether wise change. Every good farmer knows how to make good stable manure, and, having made it himself, he knows just what he may reasonably expect to accomplish with it. I believe that he should make as much of it as he can profitably — that is, without keeping stock at a loss; that this home-made manure should be his main stand-by; that he should supplement it, not displace it, by commercial fertilizers. Following this course, I believe that experience has clearly shown that this manure, aided by lime, will give better returns than without it, and that his soil will take on a better condition at the same time.

Plaster, in its action as an amendment, is a puzzle. More theories have been advanced about it and given up for new ones, than about any other substance applied to the soil to make the crops grow. It would be of little use to consider their respective merits in so short a time. I will confine myself to one matter only, which has a special bearing on its use in the stables and the manure pile. It is generally credited with saving nitrogen, especially in its compound called ammonia, from waste. It is a fact that, chemically, it can do so; and it is also a fact that stable manure may lose a good deal of its valuable nitrogen, even if not badly neglected. On this

point some remarkable results were recently obtained by two eminent and reliable French chemists. In trials with a fold of thirty-two sheep, it was determined that twenty-two per cent of the nitrogen of the fodder was fixed in the animal, in the increase of carcass and wool, both of which contain much nitrogen in combination; 19.7 per cent was found in the manure which was received on an impervious bituminized and well-stamped ground floor, leaving the large loss of 55.6 per cent, which was not to be found anywhere about, and must therefore have escaped into the air; and, as supporting this supposition, the air of the fold was found to be 400 times richer in ammonia (as carbonate), than common out-door air. Another experiment was tried with two cows, in which the loss was only twenty-five per cent. Cow manure does not undergo the fermenting change by which ammonia is formed, so rapidly as sheep manure does. The third experiment was with sheep kept in folds, and littered first with straw, then with dry earth. Nearly fifty per cent of the nitrogen disappeared again when the litter was straw; but, littered with about eight inches of earth, the loss was only twenty-four per cent; littered again with straw, the loss was fifty-one per cent. Horse manure was not tried, but I do not see why the loss should not be even greater than in the sheep manure, for it certainly ferments as readily. This is a serious matter, when it is considered how valuable nitrogen is in manures.

The supposed and very generally acknowledged usefulness of plaster in saving nitrogen from loss has recently been tested at a German experiment station with favorable and confirmatory results. On a small scale the admixture of this material, at the rate of one and one-half pounds to every hundred of manure, almost entirely prevented loss of nitrogen while the same manure treated in the same manner except as to the addition of plaster, lost almost half its nitrogen. The use of less plaster, half a pound to 100 pounds of manure did much less good. In other and earlier experiments comparative field-trials of stable manure to which plaster had been added, with that which had not been so treated gave always better results with the plastered manure. In these experiments a trial was also made with kainit a product of German salt mines, and for which some remarkable claims have been made as a preservative of nitrogen; but the, for us, very much cheaper plaster did better; in fact kainit was of little use.

It is not fully proved by any of these experiments that the use of plaster in this way will pay; but certainly the loss of so much of the nitrogen of the fodder, not getting it either in the increase of the animal or in the manure is not profitable; and any comparatively inexpensive ways of preventing it are worth a careful trial.

Q. Will it answer to spread plaster in the pig pen?

Professor CALDWELL.— Yes.

Mr. WOODWARD.— I will say yes also. You can't make better use of it; spread it liberally and spread it wherever ammonia is escaping.

Q. If manure treated with plaster to retain the nitrogen, is drawn to the field and used as a top-dressing, will not the nitrogen then escape and be lost?

Professor CALDWELL.— I think it will not. The plaster saves nitrogen by converting the ammonia, liberated by fermentation which is volatile, into sulphate of ammonia which is not volatile.

Mr. WOODWARD.— I have used plaster for years, it should be used every day, in the stable, in the pig pens and in the sheep pens. If you go into your barns or yards and smell ammonia, fertility is flying away, and the application of plaster will stop it immediately.

Q. Will it stop the heating?

Mr. WOODWARD.— No, sir. Stop that with water.

Mr. CURTIS.— You stop the heating with water, and at the same time you can start heating with water. Keep your sheep manure moist and leave it in the sheep-houses until you want to use it in the fall and you can hardly stand the smell of ammonia when you move it, but plaster will absorb the most of it. You don't want to use plaster by wholesale, a moderate quantity will answer.

Manure Without Money.

Read at Batavia Institute,
By HERBERT MYRICK,
Editor Farm and Home, Springfield, Mass.

If we could make something out of nothing, we could all make manure without money. The men who go around the country peddling recipes for making a fertilizer at home at a cost of fifteen dollars a ton, as good as the commercial fertilizers that cost forty dollars a ton, are nothing less than frauds. They try to make us believe that we can make something out of nothing. But the men who are humbugged into buying these recipes get their money's worth, for the recipes are mostly well-known directions for composting muck, lime, plaster, hen-manure, vegetable and other refuse on the farm. The more we utilize these home sources of fertility, the more manure we can get without a direct outlay of money. But composting muck or vegetable refuse and other stuff that we find on the farm, does not add anything to their intrinsic value. It merely makes the nitrogen, potash and phosphoric acid already there more available as plant food, by rotting down the various substances composted.

In buying commercial fertilizers, we frequently spend a good deal of money and get comparatively little manure. This refers particularly to New York. We have in most of the Eastern States a system of fertilizer inspection by the State chemists. This system originated in Massachusetts fourteen years ago, and has been adopted in most of the States where fertilizers are used. It has driven the manufacture of bogus goods out of the market, has increased the quality of fertilizers, reduced prices and largely benefited farmers. But the State of New York does not have this system of fertilizer inspection; and an immense amount of poor stuff is shoved off upon the farmers at comparatively high prices. I can give you no definite statistics on this point, because there is in this State no provision for gathering data upon which to base

them. But I believe, that of the total amount of fertilizers sold, a large per cent of low grade goods are sold at high prices. This should not be. There should be a reform in this matter, and this reform should begin right here at this meeting. One of the most beneficial uses of these farmers' institutes is to inaugurate just such reforms as this.

The use of fertilizers is increasing, and is bound to increase. It is easier to begin the work of inspecting fertilizers now than it will be ten years from now. The Hon. Wallace Tappan, of Onondaga county, at the last session of the Legislature, made strenuous efforts to put through a bill providing for the State inspection of commercial fertilizers, upon the system employed already in many States; but that bill was defeated, not because fertilizer manufacturers opposed it, but because it was found that the bill was unconstitutional. If there is a clause in your Constitution of such a nature as to prohibit an efficient system of fertilizer inspection, your work for fertilizer inspection must begin at the approaching constitutional convention.

But to return to the manure question. When we buy grain and feed it to our stock, we calculate to make enough profit, on the meat or dairy products produced, to more than pay for the grain. In such cases the increased value of the manure, caused by feeding grain, has cost us nothing; we get the most valuable of all manures practically without money. Let us remember that the value of manure depends principally upon the food given to the stock. If we feed meadow hay we get meadow-hay manure, and if we feed cotton-seed meal and oil meal we get manure correspondingly rich in nitrogen, potash and phosphoric acid. The idea that manure is manure, and that there is little difference in the quality, is a common but erroneous belief with many farmers.

The manurial value of barn-yard manure, like commercial fertilizers, depends upon the amount of nitrogen, potash and phosphoric acid that it contains. Besides these, it also contains a large amount of vegetable matter, which has a very beneficial action on the soil. The result of this action is that the plant food in the soil is rendered more available to the crop. If you add in the shape of manure only half as much nitrogen, potash and phosphoric acid as the crop removes from the soil, the other half is taken from the soil. Keep this process up long enough and run-out lands are the result. If we use on one field manure made

from feeding timothy hay and corn meal, and on another that made from feeding clover hay and cotton-seed meal, the field receiving this last manure will be much richer than the other. Both the fields may produce about the same crops for the first year or two, but in the long run the increased richness of the manure will show itself; and on poor soils it will show itself almost immediately. A good many farmers think that corn meal is one of the best feeds that can be given to increase the richness of the manure pile; but a ton of corn meal contains only about six dollars worth of nitrogen, potash and phosphoric acid, while a ton of cotton-seed meal contains almost five times as much of these elements.

The food eaten by an animal contains a certain amount of the three principal elements of plant food, a small proportion of these is required to maintain the animal economy, another part is consumed in growing the young, or in producing milk, wool, etc.; but the rest is voided in the excretions; and if all the solid and liquid excrements are saved and applied, from eighty to ninety-five per cent of the manurial value of the food goes back on the land. So thoroughly is this point recognized in the old country that it has become the very foundation of the new system in English agriculture by which alone tenant farming in that country can now be made profitable. The Agricultural Holding's act, passed by the English Parliament in 1883, provided that when a tenant left a farm, the landlord should return him the value of all the unexhausted plant food that the tenant had added to the farm, whether in the form of fertilizers or in the form of concentrated feeds. And tables have been prepared showing just how much is left after each crop and the money value of the same.

Now, if the manurial value of foods is such a practical thing that the English tenant can demand a rebate for the plant food added to the farm in the concentrated feeds purchased, and not removed in the crops sold, it certainly is a practical thing for the farmers of New York.

I believe that we can make manure with much less expense by intelligently feeding concentrated foods than the same quantity of actual plant food can be bought in the form of commercial fertilizers. I believe in fertilizers, but I don't believe in using them until we have utilized every possible source of home-made manure. And when oil meal or cotton-seed meal can be purchased at about

the price which the plant food they contain would cost us in the shape of commercial fertilizers, we are going to get a very handsome profit by buying these articles for feeding purposes.

To make manure without money we must permit *no waste of the solid or liquid* manures. Much has been said on the subject, yet we do not fully appreciate the value of the liquid portion of the manure. We know that so much of the food eaten by our stock, as is not digested, passes off in the solid excrement, and, therefore, is added to the manure pile. Of the food digested, the potash and phosphoric acid that are excreted also go off largely in the solids; but the nitrogen digested is mostly excreted in the liquids. When these nitrogenous constituents of the food are digested, the nitrogen which they contain, not used by the animal economy, changes into urea, and is passed off in the urine. So thoroughly is this fact established that the amount of nitrogen contained in the urine is taken as an *accurate measure* of the nitrogenous matter digested or decomposed in the body. Since nitrogen is the most expensive element of plant food — costing us in commercial fertilizers from three to four times as much per pound as the potash or phosphoric acid — it is going to pay us to take great pains to save the liquid excrement, which contains the larger part of the nitrogen. Of course, all know that the simplest way of doing this is by the free use of absorbents; but many do not use enough absorbents. Professor Roberts' idea of using the strawy horse manure as an absorbent behind the cows, in addition to muck, loam and other absorbents, is a most excellent one. Where this plan is followed, the liquids are absorbed so completely that the manure pile, if not exposed to rain, is dry enough to be handled conveniently with a fork. Where absorbents are not used in sufficient quantity, the bottom of the barn cellar is usually a perfect pond of liquid manure, the soluble elements in which leach away into the soil and are lost. This is the condition on many and many a farm in New England, and I dare say is the case in New York also. I once worked a farm where there was no cellar under the barn, but the manure had been thrown outside. The first thing I did was to put a cellar under that barn. In digging out for the cellar I found the earth under the cow stable was colored to a depth of over two feet by the liquid soaking from the cow stable above, which had been leaching through into this soil for years. I applied that earth to grass land, and got results as good as were produced by a standard commercial fertilizer. It

was a veritable manure mine under that barn, and it gave me lots of manure without money.

The plowing under of green crops, especially on light soils, is one of the most common ways of making manure without money. For this purpose the clover plant is the most valuable. The virtues of clover have been sung for years and years, and yet there can not be too much repetition on this point. You doubtless know that investigations at the Cornell Experiment Station showed that the clover roots and second growth of clover on an acre contained thirty dollars worth of nitrogen, potash and phosphoric acid, the roots alone containing about twenty dollars worth. The clover, probably, obtained some of this nitrogen from the air—perhaps quite a large quantity, indirectly. The clover also obtained its phosphoric acid and potash from the compounds in which these elements of plant food were stored up in the soil. Now, if we plow under a large growth of clover, we return to the soil all the plant food contained in the growth of the clover, as well as in the stubble and roots. The plant food thus returned to the soil is available to the crops as soon as the clover has rotted, and this accounts for the larger crops of wheat that we get after clover. Investigations similar to those at Cornell have been carried on in Germany with other crops, and they show that the roots and stubble of wheat on an acre contain only five dollars and fifty cents worth of plant food; of rye, nearly fourteen dollars worth; of buckwheat, nine dollars worth; and of barley, five dollars worth. Green manuring does not add to the soil, except vegetable matter and nitrogen. The above results with rye afford a partial explanation for the continued production of farm crops of rye on poor soils without manure. Another way to make manure without money is not to sell off from the farm anything that has a high manurial value, but feed out such stuff on the farm and sell the product, thus retaining the manurial value of the stuff on the farm. If you will look at the table of manurial values, you will see that a ton of butter contains only sixty cents worth of nitrogen, potash and sulphuric acid, while a ton of cheese contains twenty dollars worth of these elements of plant food. In other words, every pound of cheese sold off the farm contains a cents worth of fertilizer, mostly the expensive nitrogen.

Here is one argument in favor of butter making or creameries, instead of cheese making or cheese factories, and this item has

been so thoroughly considered by Vermont farmers that it has had an important influence in inducing them to change largely from cheese making to butter making. When butter is made we don't rob the farm, but all the grain bought and fed to cows on the farm is so much fertility added to the soil. So, to make manure without money, as well as to make the farm pay better, I believe most heartily in winter dairying. Let the cows calve in the late fall and early winter, and let us make all the cream and butter possible from September to May, when the price of the butter will return us decent profit. During this time we can afford to feed our cattle well on concentrated foods in connection with what we raise on the farm, thus making a large amount of rich manure. Let us do as little butter making in summer as possible and devote our attention to raising fodder and grain crops to feed out in the winter. By this system less hired help will be required in the summer, and the farmer will have plenty of time in winter to attend to the feeding of his stock and the butter making himself. If this be done judiciously and only gilt-edged butter made, it will practically answer the question, "How to make manure without money."

Points in Poultry Keeping.

[Brought out at the Batavia Institute in answer to the question, Can farmers make the keeping of poultry profitable; and how shall it be kept to be so?]

Mr. RICHARDSON, of Orange county.—I have a boy twelve years old who has taken considerable interest in this question. Having a hennery on the farm, I made an arrangement with him last year by which I rented him the building and gave him the use of fowls then on hand. He took the entire care of them, buying his feed, in order to ascertain if there was any profit. Last year he deposited twenty-five dollars in the savings bank. On the 1st of January, 1887, he had at least fifty dollars worth of hens, and put another twenty-five dollars in the bank; at this time he has about twenty dollars more. In the morning the food consists of potatoes or turnips, cooked or chopped fine, and scraps from the kitchen, with a little meal, giving them also plenty of ground bone and oyster shells; also fresh water. In the evening he gives a feeding of corn and buckwheat, or corn and oats. He has obtained during the months of January and February, from 200 hens, an average of two dozen eggs a day. The hennery is not warmed artificially, the hens creating sufficient warmth.

Mr. CURTIS.—Mr. Richardson has told what a farmer's boy can do, and I want to tell what a farmer's girl can do. I have been wrestling with this hen problem all my life, and I confess I never have succeeded in getting hens to lay in the winter. My little girl had charge of the poultry last year, and became very much interested. The first thing she did was to cut a hole from the hennery to the sheep shed to make a place for exercise, and have greater range where it would be warm. Then she shut up the hen-houses on the outside, and made it warm, and she never let them out all winter long. One of the greatest secrets of the hen business, is to keep them out of the snow and prevent their getting chilled. In the morning she gives them plenty of warm water, and a feeding of scalded wheat bran and corn meal, also vegetables and fruit chopped up, meat and pounded oyster shells. In the afternoon

they have corn and light wheat. Now, the result was, the hens have laid beautifully all winter. So the girl has beaten me, and the boy too, I think.

Mrs. TOWNSEND.—I am very much interested in poultry raising, and have had considerable experience. As our people objected to having the poultry run in the sheep barn, we have a house for them. I have two breeds, the Wyandottes and Plymouth Rocks, the Wyandottes proving the favorite, although we like the Plymouth Rocks. We have succeeded in having winter layers; last winter, from fifty pullets, we gathered from thirty to forty eggs daily, getting an average of thirty during the coldest weather. Our feed differs somewhat from that described. In the morning we give them a warm mixture of ground oats and corn and a good share of bran. We also chop our potato and apple parings, and add those to the morning meal, making a good, soft feed. We also give them warm drink, and keep them confined indoors from November until the snow disappears in the spring. As it is necessary that they have exercise, we give them grain in chopped clover hay at noon. The clover hay they eat with the greatest relish, and we think it a good egg producer. At night we give them corn on the ear, which has been made very hot in the oven, letting them pick it off, which also gives them exercise; and this is the only corn we feed. Green food is very essential for eggs. Last year we had a Wyandotte cock and hen and three pullets, and from this hen and three pullets we hatched over seventy chickens, and sold ten dollars worth of eggs. We have realized in this and the stock sold over seventy dollars, and still have left for this year two old hens and twenty-four pullets.

Mr. ELLIS.—It seems to me we ought to get our Yankee spirit up to such a point that we may raise eggs for our own consumption, at least, and not be importing them, as at present, by the million. Dry, hard oats are not good for hens; they should always be scalded, and when so treated are a capital grain. I allow my hens to run among the strawberries, raspberries, grapes and currants, and in fact I trust them everywhere before the berries ripen.

Mr. REMINGTON.—I would like to ask Mr. Curtis what his hens do in the summer time—how much range he gives them?

Mr. CURTIS.—My little girl has them range over quite a little territory. She has different runs for them and divides the ground up in that way. The less you have them run about the premises the better, for they are very knowing and liable to get into mischief.

Mr. WOODWARD.—The best use to make of poultry in summer is to keep them in the orchard. Make little houses eight by ten or eight by twelve feet and place them at different places in the orchard and put the hens in them, feeding them there morning and night. They will soon become accustomed to these houses, and will not wander far away. It is the best way to dispose of them in summer. They will more than pay their way by destroying bugs, and they will do better there than in the best hennery you ever saw.

One word upon ventilation. Most people ventilate from the top of the house, while they compel the fowls to roost near the floor. They thus make it as cold inside as out, and might as well have their fowls out of doors. No wonder so many fowls thus treated die. My plan is to put the roosts near the ceiling, with a tight floor underneath, and to ventilate the house by trunks running from near the floor up to, and out at the roof. By this plan the warm air is kept in, but the colder, impure air, taken out.

Q. Which are preferable for hen-feeding, oyster-shells or pounded bones?

Mr. WOODWARD.—Pounded bones, for the reason that the hen needs something besides materials for the shell of the egg. She needs phosphoric acid and nitrogen to make the meat of the egg. The bones contain a considerable portion of these, while oyster-shells have very little of either.

Q. Would you advise keeping hens until they are more than a year old?

Mrs. TOWNSEND.—It is not profitable to keep hens more than one year. We like pullets for winter layers, and old hens are inclined to get too fat.

Practical Entomology.

Delivered at Lockport Institute,
By Prof. A. J. COOK,
Of Michigan Agricultural College.

The day when insects, or to use the vernacular of that day, when bugs were regarded as an insignificant part of creation, their study unworthy a sane mind, and he who studied them, a person to be watched with suspicion, is most fortunately past. One of the most significant and hopeful signs of these better and wiser times is the fact that men are coming everywhere to consider no studies more valuable or worthy of respect, no truths more deserving of the hard patient seeking of the best intellect, than such as relate to even the smallest objects about us. It requires the highest power of the microscope to reveal the germs of bacteria which float in every sunbeam, yet these germs may bear in their fatal clutch the message of death. What more noble than to study their life-history, and learn how to unloose their terrible hold. Though insects may not steal in upon our vitals and drink out the life-blood, they do form most important wheels in the grand machinery of the world, and may by their unresisted action, bring the gaunt, and ugly wolf of famine to the door. Among the flood of glorious truths uttered by the Master of Nazareth, was: "By their fruits ye shall know them." This rule is dignifying, glorifying scientific study, in all its departments. And so to-day he who unravels or explains the marvelous development, and life-history of even the tiniest insect, is sure everywhere, all over our land, of hungry eager listeners. It is my desire at this time to show you how insects work in the grand economy of nature, and how intimately their success, and life-work are interwoven with our own welfare and the schemes most dear to us.

It is a recognized fact in science to-day, that nature exhibits one grand harmony. Each part and organism of the world touches every other part. Each is a wheel whose cogs must fit into the

cogs of every other. Each is a barrier to others, ever saying "Thus far and no farther." Like the members of the body each ministers to the other, and none can say to the other what need have I of thee?

This interassistance and interdependence is most graphically illustrated in the valuable work wrought by insects in the fertilization of plants. Many plants, like the pistilate varieties of our strawberries, and among these are our best and most highly-prized kinds, and like our squashes and other cucurbitaceous vegetables where the male and female organs are in different flowers. Unless there are ever at hand insects — those marriage priests of the vegetable world — to bridge over the distance between stamen and pistil, impregnation can not be accomplished, and barrenness must result. Even in plants with perfect flowers like our clovers, and all our fruit trees and shrubs, though anthers and stigma may rest side by side in the same flower, yet we know undeniably, from the most painstaking and reliable experimentation, that unless there is intercrossing from flower to flower only a meager yield of fruit or seed is produced. We find at the Michigan Agricultural College that if we inclose heads of white or alsike clover, so that no bees can reach them, they bear very few seeds. As you all know, the first crop of red clover bears almost no seed. We find that if we shut the bumblebees away from the second or August bloom the same is true of that. Dr. Beal has suggested to me that I try to protect the queen bumblebees, so that all may live through the trying months of winter, and thus add to the fruitfulness of such plants as only their long tongues can reach. We see then that farmers and horticulturists are vitally interested in such insects as are attracted by pollen and nectar. The very fact that any plant has showy flowers, or flowers that secrete nectar or scatter perfume, is proof positive that such plant needs insects to insure full fruitage. Geology shows us that before there were sweet-loving insects there were no beautiful flowers to scatter their delicate perfume. The beauty and fragrance are the wooers, and wooing implies objects to be wooed.

Again many of our vegetables, and nearly all of our fruit trees and vines are in bloom early in the season. At this early date, most sweet-loving insects are very rare. The rigors of winter reduced their numbers, and in almost every case it is the individual, not a colony, that wakes to life on the opening of spring. How

important then are the honey-bees. They are fortified against the winter's cold. It is thousands, not one or a pair, that waken to life with the return of spring. Few farmers and fruit growers realize how much they are indebted to the honey-bees for their fruitful harvests. Often our pomologists wonder that such a profusion of bloom is followed by such a meager show of fruit. Had they noticed that rain or cold held the bees prisoners in the hives, while the fruit trees put on their garments of pink and white, they would have had the solution of the puzzle. Some years since a noted gardener near Boston, in a region where the bees had been exterminated, found that his squashes and melons refused to fruit. Surmising the cause of his ill success, he secured some colonies of bees, since which time his harvests have been satisfactory. A few weeks ago I had the pleasure of addressing the horticulturists of Ohio. I urged upon them the importance of bees as aids in their work. To my surprise every person present was in accord with the view I presented. Mr. Farnsworth, a grower of small fruit near Toledo, remarked that a few years ago nearly all the bees in his neighborhood were killed by the hard winter. The next season his crop of fruit, especially of strawberries, was very disappointing. The following year the bees were restored, and the yield of fruit was up to the average. The point I make then is this; the fruit grower is pecuniarily interested in the success of apiculture, and if wise, instead of discouraging the bee-keeping industry in his immediate neighborhood, he will do all he can to foster it.

It is also a thoroughly demonstrated fact that bees do not attack sound fruit. The anatomy of the bee, as well as their known habits prove this. Bees do not go chiseling around like woodpeckers and tit-mice, in search of food. They only visit vessels of sweet that are already uncorked. If bird or wasp, or even Dame Nature herself, withdraw the cork, then the bees, true to their instincts of economy, fly to the spot and sip up the nectar, "that nothing be lost." In case of grapes, if very ripe, and a sultry sun pours its hot rays upon them, they are very likely to burst open, when the bees swarm upon them in force.

Our second point, then: Bees never attack sound fruit, but only sip from that which is already bruised or wounded. Much more absurd is the assertion, sometimes made, that bees injure flowers, and thus decrease the fruitfulness of buckwheat and other valuable grains and fruits. Bees never tear or puncture flowers. The large,

wild carpenter bee (*Xylocopa*) does do this sometimes, but even then no harm is done to the plant, as the showy petal serves no other purpose than to attract insects. This done, they might as well be removed. But even the *Xylocopa* does not tear them from the plant, but only slits them to gain access to the nectar in the deep corolla tubes. We say, then, with all confidence, that bees are always and only beneficial to plants, and should always be regarded with most kindly gratitude by all who grow fruit, grain or vegetables.

OTHER INSECT FRIENDS.

It is not alone the insects that love and seek the nectar of flowers that confer a matchless favor upon the husbandman; but others there are which are the "watch dogs," as it were, whose valuable work it is to attack and overcome the hosts of insect enemies which would otherwise "eat every green thing from off the face of the whole earth." The bees affect fertilization and fruiting; these other insects make the very existence of the plants themselves possible. There are two great groups of these friends of the farmer: the predaceous and parasitic. Predaceous insects are such as capture and feed upon other insects, chiefly those that live upon plants and vegetables. Of these are the wasps, which lay a heavy contribution on our gratitude by their kindly offices in destroying slugs, caterpillars, grubs, etc. It is refreshing, on a hot, sunshiny day of June, to sit under some goodly shade-tree in the currant vineyard, and see the several species of insectivorous wasps flash down upon the currant slugs and carry them off by dozens. The robber flies — *Asilidæ* — of the order *Diptera* or two-winged flies, are also fierce enemies of many of our worst insect pests. These robber flies also have a sugar tooth, for it is not rare to see them dash down upon the unsuspecting honey-bee as it is about to enter the hive with its full load of nectar, snatch it up, and dart away to some tree to enjoy the repast of meat and wild honey — a veritable John the Baptist in its tastes. The syrphus-fly maggots are also immature two-winged flies. These are the pointed larvæ which nest among the plant-lice. Frequently there are two or three on a single small plant. And to see them among a colony of plant-lice, reminds one of a growing boy in the midst of buckwheat cakes and maple syrup. It is astonishing how many plant-lice one of these maggots can suck dry without even stopping to stretch or pick its teeth. It is exciting to see the maggot stab a louse with its dirk-like head,

then fairly rear up on its plump posterior, all tremulous with excitement as it pumps the juices from its struggling victim. When at last the louse is sucked dry, it is tossed off with the utmost indifference, and the good work at once repeated upon another, and then another of the ruinous lice. Small as are these syrphus-fly maggots, they are the authors of incalculable benefit to all vegetation, and so to our agricultural interests. A student when watching one of these insect gourmands remarked, "the thing must have an infinite appetite, and an India-rubber stomach." When we remember what terrible destroyers plant-lice are, and that a single pair may become parents to a billion in a single summer, we can appreciate the good work of these syrphus-fly maggots. The syrphus-flies are very showy, being ringed often times with bright green or yellow bands. They are, therefore, not only handsome "in that handsome is that handsome does," but genuinely handsome. These flies are marvelous in their flight. We see them poised above a flower, seemingly held by an unseen hand; when startled by some movement on our part, the fly flits away like a flash of light, and is hovering, all motionless, as it seems, above another flower.

Among beetles we have many families that act as predaceous insects, working to aid the farmer in his grand accomplishments. The ground and tiger beetles, both as grubs and as imagos, are veritable rat terriers; cut-worms, etc., being in this case the rats. Nothing is more exciting than to see one of the black horny grubs of some of our common black ground beetles, fasten on to a cut-worm. The caterpillar may be twice the size of our insect lion, and yet the grub takes hold with the utmost fearlessness and confidence. The cut-worm doubles up, twists around into knots, rolls over, fairly dances with rage, fear and pain, making the grub fly like the cracker of a whip lash, and yet he holds to his grip. When at last the cut-worm, tired out, ceases his gyrations, only to shrivel up as his life-blood is sucked out by his destroyer. Occasionally the farmers and fruit growers feel that the cut-worm is too much for them, and they almost despair of securing a livelihood, not to say a profit upon their capital and labor. Were it not for these black, ferocious grubs, ill success would frown upon them every year, and such crops as minister to the support of these cut-worms would have to be abandoned.

Who does not know the handsome lady-bird beetles — those

little yellow or orange drops of vitality adorned with beads of jet? I supposed that every child knew, and was fond of these beautiful insects. Yet the past year, I have received them repeatedly, and from this great State of New York, with the remark that they were killing the fruit trees, and begging for some remedy that would banish them. The truth is that these insects, both as grubs and as mature beetles, are to be numbered among our most valued insect helpers. While these insects feed upon nearly every one of our insect pests, they are peculiarly destructive to the plant-lice. It is hard to say which is most entitled to our thankful regard, the syrphus-fly maggot, or these lady-bird beetles. You have noticed how threatening the plant-lice are each May, when the apple leaves and twigs, and the cherry leaves are black and thronged with them; and how the army of sappers seemed to suck the very vitality from tree, shrub and herb, till you felt that these blighting lice were to filch from you your most highly-prized belongings. When, presto; with June came almost complete deliverance from the baneful lice. You may not have known that the saviours of your plants were these little humble maggots, and the more beautiful, and equally valuable lady-bird beetles and grubs.

There are also some of the bugs with their bayonet-like beaks, and many laced wings, like the dragon-flies, that aid to swell this valuable army of insect friends, though their silent, often obscure work, is generally unknown, and so unappreciated. Yet upon their kindly warfare depends the success, aye, the very existence of agriculture as an art; and though they seem so insignificant, the very hope of the nation hangs upon them.

PARASITIC INSECTS.

These insects are no less our friends than are the predaceous species. Parasitic insects lay their eggs in the bodies, usually of plant-eating insects. The eggs hatch anon, and the wee larvæ commence to feed upon their host. Often a single caterpillar, like the cabbage larva, may thus furnish food for scores of these little parasites. Often the parasites will not so injure the host, that the latter will not complete its growth, and in some cases may have strength sufficient to spin its cocoon, and occasionally to change to a chrysalid. But there it always ends its career. Thus each year, millions of insects on every farm are devoured by these concealed parasites, which find in their victims both food and a home. Often

as in army-worm years, insects swarm upon us and often threaten the most terrible destruction. Such armies are let loose only because some calamity has overtaken these defenders of our interests — the hosts of parasites. The only reason that these wide-spread devastations do not continue every year, is that the parasites confront them with the, "thus far canst thou go and no farther." Of these very important insects, four families have four wings and are related to the wasps and ants. The intelligence or sense of perception of these Hymenopterous parasites, the ichneumons, chalcids, etc., is something marvelous and incomprehensible. How they can find their victims, sometimes robed in a thick silken mantle, or rolled up in tough leaves, often concealed in the pulp of a fruit, or again hidden in some tunnel of hardest wood, is a puzzle indeed. Yet these parasites hunt them out, and know just where to insert their augur-like egg tubes that the fatal eggs may reach the hapless victims, and the prospective younglings be in the midst of plenty. Nothing is more surprising to the practical entomologist, in his study of insects, than to find how each injurious species has its, from one to several, parasitic enemies, and how these last are ofttimes so minute that scores may find food enough and to spare, in a single caterpillar — so small that even a tiny plant louse is an abundant larder, indeed so tiny that even an insect egg may in some cases be all the food that is required to bring the wee parasite to maturity. Among the *Diptera* or two-winged flies there is also a large and important family of parasites. These look exceedingly like the common house flies to which they are closely related. These insects lay the fatal eggs on the outside of the host that is to feed the prospective maggots. As soon as the eggs hatch, the tiny maggots bore into the host, and laugh and grow fat, as they munch away at the fresh, tender insect steak, not caring what twinges of rheumatic agony their host endures, so long as it "gives of its substance" to nourish and sustain them. These facts are not merely interesting and curious, they are pregnant with vast practical suggestions. These valuable insects should be known and protected by the practical man. Small as they are, they may be reared and disseminated, and thus their good offices may be vastly extended. Last but not least, they also furnish hope, and so are the silver lining to the darkest cloud which devouring insects may spring upon the farmer's prospects. Three years ago it seemed

that many of our finest shade and ornamental trees must succumb to the fearful havoc of the myriads of bark or scale lice. Two years ago the number of these terrible sappers was hardly diminished, yet upon examination we found that almost every louse had been bored by a destroying parasite. This year it was hard to find a single living louse, and the trees have picked up again, and will soon recover from the setback, which in many cases came near their total destruction.

These little concealed parasites are the great bow of promise which declare that the floods of disaster shall be dried up, and that henceforth seedtime and harvest shall come.

I shall now speak of some important facts concerning insecticides, and speak of two or three insects that are worthy of special attention.

INSECTICIDES.

I think I do not need to urge upon the fruit growers of Western New York and especially those about Lockport, the value of Paris green and London purple in combating the codling moth. That these arsenites are a most valuable and satisfactory specific against this greatest pest of the apple orchard is proved beyond any possible doubt; that they may be used with no danger is also proved by such witnesses as the microscope, the chemist's analysis, and experience. It is also worthy of remark that when used to protect against the apple larva, the last of May, there are also at work upon the foliage of our trees several serious enemies, such as the canker-worms, the tent caterpillars, and several leaf-rollers, all of which are destroyed by the same remedy that we find so fatal to the codling moth larva. Thus we may say that in hurling this stone we may kill enough other birds to pay for our effort, and we really secure our fruit against the "apple worm" at no expense.

There are a few suggestions that our experiments lead me to offer: First, we should be sure to apply this remedy in season. Almost as soon as the blossoms fall, before the fruit is larger than two-grain quinine pills, the trees should be sprayed. Treated thus early, I have met with astonishing success. Even though I used but one application. While two applications will do more than one, I think one at this early date will give excellent satisfaction. Those — and they are very few — who have not been fully satisfied in the use of this specific, have failed, I think, by

waiting too long before they sprayed their trees. Again, it is very desirable to scatter the poison very widely, but it is not necessary to use a strong mixture. I doubt if so little of the poison can be scattered upon the calyx of an apple in case it touch every part, as not to seal the death-warrant of any codling larva that may attempt to eat into the fruit. What I suggest, therefore, is to use a very dilute admixture, not stronger than one pound of Paris green or London purple to 100 gallons of water, or one-third of a pound to a kerosene barrel of water. This, kept well mixed, is strong enough, can be thoroughly used and not blight the foliage, and, of course, it stands to reason that in the use of such virulent poisons, we should never use more than is positively required.

It is also very desirable to throw the liquid with much force and as a very fine spray. This insures such a thorough diffusion that no rascal may expect to escape. The Cyclone nozzle works well, but a spraying nozzle—the Nixon, made at Dayton, Ohio, works still better, and seems to be just what is required. By the use of such an instrument, we can surely hope to scatter the spray everywhere, and yet use but a very small amount of the poisonous mixture.

It is also very desirable that the barrel which contains the poison, and to which the pump is attached, should be firmly secured in the wagon. I have known of several cases the past season, where the barrels have been thrown out, and the pumps broken, and in most of the cases, at least, the responsibility could not be traced to a barrel, or even to a jug.

I would urge the use of the arsenites wherever they are effective and where there is no danger in their use. They are, of course, not to be used in fighting lice, bugs or curculio, as in these cases they will not be eaten and so will do no good. They are not to be used on cabbages or on currant bushes for the slugs, as such use is dangerous and inexcusable. For the cabbage, Buhach or California pyrethrum is just as efficient and entirely safe, while white hellebore has long been used with entire satisfaction on the currant slug.

KEROSENE AND SOAP MIXTURE.

You have all heard and read of the kerosene emulsion with milk. After many experiments, I am decidedly averse to the use of this. The milk is only valuable to aid in forming the emulsion,

and I find that it is not good for the foliage. Tender foliage often shows the effect of its use for a long time. This is not true of the kerosene and soap mixture. The soap makes the kerosene miscible, is not at all injurious to the foliage — indeed, I have thought sometimes that it seemed directly serviceable, and besides the soap itself is an insecticide. I use a pint of kerosene to a quart of soft soap. Less soap and hard soap will answer if soft soap is not at hand. I use abundance of soap as the mixture is more permanent, and I believe the material works more effectually. These two substances are thoroughly mixed; I then dilute this mixture with water in the proportion of one to three. This mixes well, and is generally destructive to all insects to which it is thoroughly applied. It should not be turned gently upon the insects from a sprinkler, for in this way many of the insects will not receive the drenching required to kill them. I prefer to dash it upon the infested plants, by use of a force pump and spray nozzle, then contact is sure, and death certain. While I have never injured a single plant by use of this mixture, I have by its use killed plant-lice, bark-lice, cabbage, radish and onion maggots, rose slugs and many other of these insect enemies by the million. I recommend this where the arsenites are not available, and where the use of kerosene is not distasteful. There are reports that this will not kill plant-lice. I reply it will every time, if used as explained above. It is also reported that it is not a success when used against the Anthomyion maggots. I have used it with marked success against them, both in the garden and in the laboratory. It will kill all the maggots that it touches. It will not kill such maggots as have tunneled far into the plants, and so are out of reach of the liquid. These insects are just so mean that they wont curl up and die just because we have applied the mixture. We must give them a smart bath. We must then apply this to the plants every two or three days, else we shall fail to reach all the maggots. It is not so expensive as one would suppose, as in case of radishes and onions we can turn the stream of liquid on the plants just as they enter the earth, and in case of cabbages a gill of the insecticide may be turned just at the crown of each plant. We must also remember that these *Anthomyia* begin to lay eggs very early, often before the cabbage plants are removed from the hot-beds; and as it is the early bird that catches the worm, so it is the prompt attention that

preserves our vegetables. If the maggots have already used their hook-like gougers, and have grooved and tunneled the roots or underground stems, then our effort will be, at best, only partially successful.

Q. Will spraying trees not injure grass growing under the trees for feeding purposes?

Professor COOK.— I think not. I have sprayed my apple trees, and within two weeks after, I have cut that grass and fed my horses on it right along, and it did them no harm. But it is well to remember these are virulent poisons, and you can't be too careful.

Q. Would you use the same amount of London purple as of Paris green?

Professor COOK.— In my experiments I couldn't see any difference between London purple and Paris green. I like the purple because it mixes a little better with water.

Mr. MOODY, of Lockport.— I agree with Prof. Cook. London purple will kill the codling moth as well as canker worm. We have a very economical machine for doing that business. It is attached to a wagon that carries a tank, and does the pumping very well, much better than to apply a stronger force to it; and then we don't have to carry a man on the wagon to do the pumping. Our pump is a double-action pump. It raises more of the solution than will go through the nozzle, and what does not go through, returns to the tank and keeps it thoroughly stirred up all the time. Our tank holds eighty gallons.

Q. At what time do you spray your trees?

Mr. MOODY.—Just as soon as the blossom goes off, and the least particle, if it reaches the codling moths, is sure to kill them.

Q. Will one spraying do the business?

Mr. MOODY.—Yes, we think so. We have never sprayed but once in the season.

Q. What is the cost of your machine for spraying?

Mr. MOODY.—I don't know exactly, perhaps twenty-five dollars. They are not expensive.

Mr. LEACH, of Hartland.— In reference to this spraying of trees: Folks are in danger of supposing from what has been said, that the spraying was the only thing that produced the fruit crop. For the last six years there has been but little fruit, and, of course, if there was no fruit, there was nothing for these insects to live upon,

and they were destroyed without London purple or Paris green. Now, in my own case, last year I had about 500 barrels, and they were very fine indeed. We have cultivated the orchard thoroughly and pastured it, and I think where it wasn't pastured they were equally as good as those where it was pastured, and the trees never have been sprayed, and we never had finer apples produced. So it wasn't the London purple or Paris green. They have used Paris green in destroying the army worm in some instances, and it has done that; but as to its effects in destroying codling moth, I think that is a question yet to be determined.

The Joint Worm (Isosoma hordei).

Read at the Ithaca Institute,
By Professor J. H. COMSTOCK,
Of Cornell University.

The subject to which I wish first to call your attention is an old one; and one that is doubtless familiar to many of the older people in this audience; but I think it is not very familiar to the younger farmers; and I hope it will not become so. I refer to the insect known as the joint worm of wheat, rye and barley. So named because usually found near a joint of the plant.

In order that there shall be no misunderstanding, I will state that the joint worm is distinct from the wheat midge, an insect that infests the heads of the wheat. It is also distinct from the Hessian fly, which is now a much more familiar insect. But the injury done by the joint worm is very similar in some respects to that done by the Hessian fly. The Hessian fly, as you know, infests at first the crown of the roots of young wheat plants, causing them to turn yellow and die. This is done during the autumn, winter and early part of spring. The wheat plant thus injured usually tillers out forming a stool of several straws. The second brood of the Hessian fly, which occupies the late spring and summer, infests the lower joints of the straws causing them to become swollen, and to bend or break and lop down. The injury done by the joint worm is very similar to that done by this second brood of the Hessian fly. It also, like the Hessian fly, often causes the joint to swell and the stalk to bend and lop down. The work of the two, however, can be readily distinguished. The larva of the Hessian fly infests the plant between the sheath of the leaf which arises at a joint and the central stalk, while the joint worm resides within the central stalk itself. The result of the work of the joint worm is also peculiar, in that it produces a filling up of the cavity of the stalk. Although the infested straws often present swollen joints and the distorted appearance just described, this is not always the

case. A considerable number of these insects, sometimes as many as twelve or fifteen, infest a single plant; in such cases they occupy a considerable length of the straw, as much as three inches and frequently there is no external indication of their appearance, except in the weakened and stunted condition of the plant, and the small amount of seed it matures. But the presence of the insect can be readily detected by feeling of the straw; for the cavity of the straw has become filled up where the insects are and is hard and woody. In this woody portion there are little cavities in each of which there is an insect.

The presence of these insects is often indicated by these pieces of hardened straw coming from the threshing machine with the grain; their weight carrying them with the grain.

A few words as to what this insect has done in the past. More than fifty years ago it attracted much attention in Massachusetts. In certain parts of that State the cultivation of barley had been given up on account of the injuries caused by this insect. This was previous to 1830, the date at which the species was first scientifically described. I find that twenty-five years later our southern neighbors were suffering from this pest. So great were the injuries caused by it that a "Joint Worm Convention," composed of persons who were sufferers from it, was held at Warrentown, Virginia, in 1854; and a little later the farmers of this State suffered greatly. The loss was especially heavy in the central part of the State. This, as near as I can learn from the data at hand, was the high tide of the ravages of this insect in this State. Of late years but little has been said regarding the joint worm, until within the last two or three years, when it has begun to attract attention again; and only a few week since I found that fields in a neighboring town were badly infested by it. This information came to me in a peculiar way; at the paper-mill in this town it was found that a certain lot of straw which had been brought from Lake Ridge, was unfit for making paper, owing to the woody nature of certain parts of it. When these woody portions were cut open they were found to contain insects, and were, therefore, referred to me. A subsequent examination of this straw showed that about one straw in twenty-five was infested by joint worms. Certainly such numbers of this pest are worthy of serious attention. It seems more than probable that if the matter is not attended to by the farmers the past history of the insect will be repeated.

Now, a few words as to the life-history of this insect, in order that we may understand the method of fighting it. There is but a single generation of the joint worm in each year. In the autumn, the time at which it is most apt to be observed, it is in the larval state within the straw; it remains in the straw during the winter. Some of the larvæ change to pupæ early in the winter; but the adult insects do not emerge from the straw till the following May. The adult is a small, black, four-winged fly.

It is unnecessary to go into farther details here regarding this matter. Sufficient has been given to indicate the practical treatment of the question. Obviously the best way to destroy this pest is to burn the infested straw before the insects emerge. Plowing the straw under has not been found to be efficient. As the insect infests the lower part of the straw, by cutting the grain high the infested part will be left in the field; then by burning the stubble the pest can be destroyed. As wheat fields after harvest are liable to grow up to weeds, it has been suggested that the burning can be made more thorough by cutting the weeds with a mowing machine and when they are dry burning the weeds and the stubble together. As the insect winters in the straw this burning can be done at any time during the fall. If when threshing, pieces of hardened straw come through the machine with the grain, they should be carefully removed and burned. The presence of such pieces of straw in the grain will suggest the possibility of the straw being so badly infested that it ought all to be burned.

This joint worm is the insect known to entomologists as *Isosoma hordei*. The adult fly varies much in color and markings; so much that it has been described under several names. Thus Dr. Fitch, in the transactions of this society, describes what he considers to be four species of joint worms. And in the *Rural New Yorker*, two years ago, Professor Cook proposed still another name for a joint worm found in Michigan. But it is now believed that all of these are merely varieties of the same species. Riley has, however, described two other joint worms found in Illinois, Tennessee and Missouri, which appear to be distinct from *I. hordei*. These two insects, *Isosoma tritici* and *Isosoma grande*, live singly in the interior of the stalk, high up, and cause neither swelling nor hardening of the straw. I do not know that either of these species has been found in the East. Both winter in the straw and can, therefore, be destroyed by burning the infested straw.

Weeds.

Read at Ithaca Institute,
By Professor A. N. PRENTISS,
Of Cornell University.

Mr. Chairman.— In the investigations made at the university in the department in which my work is done, we endeavor to find out, among other things, all that we can that relates to the history of weeds, and of all qualities that pertain to them as living organizations. So the work does not include simply an examination of what has been recorded, but we attempt here and there, as opportunity offers, to make inquiries for ourselves, our object being to find out something in regard to them, to ascertain if there were any points of interest and instruction relating to them that we might make ourselves acquainted with, that the knowledge could be put to good use. Among other inquiries that we made was one relating to the number of seeds, weed seeds, which existed in an acre of soil. This was our first inquiry. On the first view it would appear to be a rather difficult line of inquiry— difficult to secure an answer. Our method of procedure was to take a certain quantity of soil, a fair representative of the soil that we wanted to examine, and place it in such condition that the seed would germinate and grow. In other words we placed the soil where it had sufficient moisture, heat and light. From time to time, as the seed in the soil germinated and came up, we pulled them out, and kept a careful record of the number that germinated in that way. Of course our supposition was that the whole area under investigation would be as well stocked with seeds as the portion that we used. The examination had reference to a number of different kinds of soil, and I will call your attention to a few of them. One of the specimens of soil was obtained beside a brook where it had been washed down and deposited by the water. In this soil the number of seeds found

as I have indicated, was sufficient to stock an acre of ground with 13,000,000 plants. The second soil was ordinary garden soil, taken from a garden that was fairly well cultivated, neither especially clean nor especially given to weeds; here the number was shown to be about 13,000,000. The third sample of soil was obtained from a compost heap, composed of ordinary earth taken from an old pasture, and manure that was considerably fermented, partially decayed. In this heap, the number of healthy seeds was equivalent to 34,000,000 per acre. Our fourth inquiry related to potting soil, such as we use at the university for potting plants; those again numbered 23,000,000. The fifth was ordinary muck obtained from muck beds, in the shape in which it is usually put upon fields. Here the number was very small and scarcely exceeded a million of seeds.

The calculation as to the time it would require to remove these plants if all the seeds were to grow into plants upon the area indicated is one of interest. If a person enjoying such sort of work were to commence on this acre of garden soil having 13,000,000 of seeds, and work ten hours per day, and pull the weeds up by hand and at the rate of sixty per minute, it would require the entire year to weed this one acre, Sundays included. These figures convey to your mind an idea of the vast number of weeds which may spring from the soil of different kinds.

Our second inquiry was to see how many of these seeds would grow. In regard to this it will be sufficient to take from some work done at the State Experimental Station during the last year and the year preceding. The method was to take exactly one-twentieth of an acre of soil, and take up the weeds which grew upon it, and keep an account of them during the year. The experiment in 1885, related to some sod ground which had been recently turned over; the land having been in pasture for a number of years. The number of plants which appeared on this one-twentieth of an acre during the year was at the rate of 175,000 plants to the acre. The inquiry of last year, was made in a similar way, upon soil which had been part of an old pasture, but which had been cultivated two or three years and which had been kept carefully clean of weeds and which had received no barn-yard manure, having been fertilized with commercial manures. As properly taken care of as it was, the seeds in the soil which grew would give for the whole acre about 80,000 plants during the season.

Another inquiry appropriate here, is where do the seeds come from? Two points can be stated with reference to this, that will afford some information in regard to the habits and nature of weeds. Of the two points of inquiry, the first is the way in which the seeds in question find their way into the soil. We have nature's method of distributing them. She is a great distributor, distributing them far and wide all over the earth's surface; flying through the air, rolling along the surface and thousands of other ways. Another point of inquiry is as to the origin of the plants which go to make weeds. The origin of the plants which we find among the more common weeds that infest cultivated areas may be of some interest. A very carefully prepared pamphlet or catalogue relating to this subject has been arranged by Professor Dudley, one of my colleagues in the department which I represent. He finds in round numbers as regards the Cayuga flora, by which I mean all growing upon the lands drained by the streams flowing into Cayuga lake, the species of plants growing wild at the present moment in this flora almost exactly 1,200. Of this 1,200 nearly 200 have been brought in from foreign countries, from regions outside. In other words one plant in every six of those we find growing without cultivation in our region are foreigners. By far the larger part of them came from the Old World, having crossed in a variety of ways, they came over with other plants, with other seeds, and found a foothold in our soil and spread rapidly. Among these weeds fifty may be denominated *troublesome*, more or less. Of those fifty, ten are natives of some part of our own country, coming from the west, or south or east into our region; and the others, some forty out of the fifty, came from Europe.

The next point that is worthy a few moments consideration, is as to the qualities which constitute a weed. A weed has certain qualities, certain characteristic points, as well defined as these fine domestic animals that we have heard about. Among these points, I will call your attention first to fruitfulness; the great capacity of the plant to produce immense numbers of seed. In many cases this capacity is simply enormous. I borrow these statistics about some of our common weeds. Only four I have noted. One is the dock, which has 93,000 seeds to a single plant under favorable conditions. The second is the ox-eye daisy, which has 96,000. Still more is the common chickweed, bearing 825,000 seeds produced by a single plant. The most prolific of all is the purslane,

which in a single very vigorous plant, as estimated by Dr. Sturtevant, bore seeds to exceed 2,000,000. Now, the second quality: The weed must have some efficient means of distribution. Suffice it to say that all plants which take on the nature of weeds have some means of abundant distribution. The third quality, and this is the most important of all, is constitutional vigor. It must be so strong that it will endure all sorts of conditions and circumstances, and that it will rapidly and abundantly produce the allotted number of seeds. This in reality is far more important than any other quality I have named. For we have some plants in which the number of seeds far exceed those just given, yet the plants are so delicate they never have been abundantly distributed in any part of the world, and have never become known as weeds, while they have preëminently the quality of fruitfulness. They fail through lack of constitutional vigor. Now, the fourth and very desirable quality is that so much extolled in animals, prepotency; these plants must carry to their offspring these qualities to which I have called your attention. The descendants must have the qualities of the parent, in order that the race of weeds may be kept up.

Another thing as regards classification; we find that weeds in a great measure can be arranged in four groups. The first of these are weeds that infest cultivated ground; that is hoed crops, the garden or the field. A good illustration of this sort of weed is the common purslane. The second group is found most in grain fields, and such crops as have no special cultivation after planting, or by the hoe. Of this class pigeon weed, so-called pigeon grass, is a very good illustration. The third, are those which effect meadows and pastures. I need hardly call your attention to the ox-eye daisy as a good illustration of this group. The fourth includes those weeds found in waste places.

We come last of all, to the consideration of the points that have reference to reducing to the greatest possible extent, those vast numbers of weeds which are so abundant everywhere. The first point is the necessity of using clean seed. We know that a great many weeds in various parts of the country which have proved detrimental to agriculture, have been introduced by using foul seeds, accidentally or carelessly. The second point that needs close attention, is the necessity of using clean manures. The third, and most important point in destroying weeds is promptness in cutting and killing them as soon as they appear, wherever it is

possible to do so. All I have said in regard to remedies is covered by the single phrase which has impressed itself upon me as far as I have any observation or experience in agriculture, and that is the necessity of clean agriculture, clean cultivation. If you start in with clean seed, and if you are quick to destroy the first weed as soon as it appears, you take the most effectual way of keeping rid of these pests at no great expense. But if allowed, they advance rapidly from year to year, and soon fill the soil to the exclusion of better plants, and the disgust of the owner.

Q. I would like to ask if weeds are an unmitigated evil? Is there not some benefit to farmers derived from weeds?

Professor PRENTISS.— As a stimulator to cultivation, and destroying them, they may be of some benefit. Other than that, I don't know of any special use that they have.

Mr. WOODWARD.—They have a further use. When man is too lazy to cultivate, and too stingy to seed down, they are the agents kind nature sends in to catch the nitrogen that would otherwise be lost, and store it up for another year. I would rather my land should grow weeds than lie bare all summer.

Q. How soon must we cut wild carrot in order to stop or destroy the germinating quality of the seed?

Professor PRENTISS.— It is never safe to let the weed approximate the period of flowering at all.

Mr. BREED.— I have had some experience with the wild carrot. I think the best way to exterminate them is to pull them up. It will grow from the roots year after year if only cut.

Common Sense Merinos.

Read at Batavia Institute,
By DAVIS COSSITT,
Of Onondaga Castle.

Brought up in a fine wool atmosphere, educated in the faith that the merino was created for the production of fine wool; that the character of the fleece is pretty good evidence as to the blood and breeding, the pedigree if you please, of the animal that bears it, I find it exceedingly difficult to get out of that old rut. With the adherents to prevalent theories, it would be regarded as heresy for a "sheep man" to come to Western New York, into the very heart of the sheep and wool-producing region of the State, and proclaim that our merino as we are breeding him, is a humbug, the marvelous stories we tell delusive, and his wonderful fleece a very unclean thing. But such is the verdict pronounced by those who do not fully understand the subject, but have, it must be admitted, pretty good foundation for their opinions, in view of the practices of certain extremists, whose only ambition seems to be to produce a heavy fleece, tell a big story, and to beat the other fellow at the shearing. Probably the breeders of no other domestic animals are so sensitive in regard to their favorite stock as the enthusiastic "sheepist." You may say what you please of the points of the favorite horse, the quality of the fat ox or steer, or even of the feather of the fancy chicken, and no offense is taken; but when you come to discuss the merits of the pet ram, you will find it an exceedingly delicate and dangerous subject. We must therefore go cautiously toward the almost sacred precincts of the ram-pen. And with great trepidation we propound that all-important question, the solution of which has involved so much of thought and of care and watching, that it dwarfs all other consideration with the owner and public, "How much will he shear?" Then follows an examination of the strong belly with its heavy sweat locks, and other forms of "accumulated sweetness," all of which must be

counted in at the shearing. Our attention will also be called to the magnificent wrinkles, and the fact that the hair growing on the very crests of the ridges is about as fine as the wool found in the valleys between; the strong point — the specialty is always the heavy fleece.

It is a very easy matter to produce a heavy fleece of unwashed wool, any one may do it, given a ram big enough and rough enough — for this purpose the rougher and coarser the better — with capacity to take the feed and throw out the oil, feed him generously, blanket him carefully, sweat him frequently and he will have all the conditions to win. But remember, after two or three campaigns in the show ring, two or three "fittings" for the shearing, his ramship's career is about ended; and certainly there can be in the animal creation a no more pitiable object than one of these great, gross, hairy, greasy rams, out of condition and "going to pieces," the fleece starting from the skin, hair and wool hanging in shreds and patches from the wrinkles, the whole appearance a picture of dilapidation and ruin.

From what I have said it may be inferred that I am not in favor of concentrating *all* our efforts in the production of the heaviest fleeces. I am satisfied that weight of fleece (this excessive weight that all have been striving so hard to obtain) is of really less consequence than almost anything else connected with the sheep industry; while a good, high average in the flock is desirable the extraordinarily heavy fleeces are never profitable. Many argue that we can not have too much oil in the fleece of the ram, that it is required to preserve the wool, to lubricate the staple, to prevent cotting, etc. Ever since I was strong enough to handle a pitchfork I have had the care or ownership of from 300 to 600 fine-wool sheep and never yet saw a cotted fleece, nor do I believe that such a thing was ever found in a flock of *pure* bred merinos. Although the greasy ram has his proper place in breeding, there is a limit to the quantity of oil that even he should carry; seventy to seventy-five per cent ought certainly to be sufficient for lubricating purposes — some of the greasiest have nearly ninety per cent — nine pounds of grease to lubricate one pound of fiber. Surely it is preserved in oil!

The common sense merino is well balanced, possessing a good average of all desirable qualities. He has good medium size, but is not large — large merinos are not good "rustlers" — with right

proportions of fleece and carcass to allow of the most perfect development of both. Too much fleece is highly objectionable, as it weakens the constitution and exhausts the vitality of the animal. To use a common expression, "the wool eats the sheep." Fifteen to twenty per cent of the weight of the ewe, and twenty to twenty-five of that of the ram is fleece enough for any sheep. The fleece must be well set and of as uniform length, density and fineness throughout as is possible, opening clear and free, with none of the snarl or tangle which shows it to be lacking in quality and is an evidence of low breeding. To give to the wool softness, elasticity and strength, and to promote its growth, there must be oil enough to give every fiber a slight coating, but no more. This oil should be of a light buff, somewhere between the color of "old gold" and that of good basswood honey, with a little of their luster. The thin white oil of a greenish cast, which in cold weather congeals on the skin, and is about as comfortable as a jacket of damp cloth, is to be avoided. Wrinkles — we all have 'em — are a necessity. Without them, after two or three shearings, the fleece becomes thin and light; their size and number is the mooted question. According to my own notions, when the lamb first makes his appearance in the world he should be covered with wrinkles from nose to tail. As the animal grows, and as his fleece grows, these should gradually disappear, until when in full fleece they are nearly covered and hidden by the wool. On the ram they may be more prominent, but I do not see the utility of nearly destroying a fine and otherwise even fleece by filling it with wrinkles nearly as large as one's arm, extending up the sides and over the back, and which are always covered with wool of a low grade, and usually feathered with hair on the upper edges, reducing the value of the entire fleece to about the grade of this coarse wool. Better keep a few more sheep in the flock than to support so many useless wrinkles, which are only a nuisance to the shearer and a lodging place for the maggot fly.

When bred for the purpose and properly fattened, there is no more delicate mutton than that of the merino. But having covered our favorite with wrinkles and loaded him with oil, we can not claim that he is quite up to the down as a mutton sheep. To make him a profitable feeder, we must put more tallow under his skin; have less oil in his covering, and divert him of his ruffles; but when we do this, he is no longer a

merino, so we had best go slow in this direction. There have been, however, some quite successful experiments in feeding merinos. A few years since the Hon. Charles R. Case, of West Bloomfield, sent a little bunch of wethers of his own breeding to the Chicago Fat Stock Show, where they were awarded the highest honors in competition with the choicest representatives of the mutton breeds. These sheep were not excessively oily; nor badly wrinkled; nor were their fleeces the heaviest, averaging in their unwashed condition, about eighteen pounds of wool of medium fineness. Notwithstanding this and other equally brilliant and satisfactory results, I do not believe that a family of sheep can be established that will furnish prime mutton and produce an abundant fleece, possessing all the properties essential for the manufacture of fine cassimeres and broadcloth. We will, therefore, keep the merino to his legitimate business, making his meat a secondary consideration.

In our race for the heavy fleece, we have gradually, unconsciously, perhaps, grown away from the fine-wool standard. The merino wool of to-day is not what it was in the times of Hammond and Stowell; of Wright and Chamberlain. Occasionally, without any design on our part, animals finer than the average, will appear in our flocks; the blood of such sires as Green Mountain, Golden Fleece, Comet and the Hibbard ram asserts itself, and it is time that some of us were getting back to that standard. Already the note of warning is sounded; the importation during the past year of 170,000,000 pounds of wool, at a cost of over $48,000,000, every dollar of which should have gone into the pockets of our own farmers, has an ominous meaning. This immense quantity was admitted at our ports under regulations that are grievously unjust to the American producer, for though three-fourths of it was classed as "carpet wool," "ring waste," "noils," etc., more than three-fourths of it was used in the manufacture of fine goods, showing a demand for fine wools. Nor need we hope for much relief through tariff legislation, so long as every interpretation of our revenue laws, by the free-trade economists who control our treasury department and manage our custom-houses, is in favor of the dealer in foreign wool, who, with his false invoice, his easy conscience, the comprehensive custom-house oath and the usual subsidy to the customs officials, forces his cargo upon our market, paying only the minimum rates of duty, so that our mills are stocked, as far as is possible, with the fine wools of

Buenos Ayres and Australia, and but for a temporary scarcity in those countries home-grown wool would be driven from the home market. If we expect to successfully compete with the growers of these foreign fine wools, we must produce a better article than they possibly can. We must improve our own fleece, rid it of its grossness, of its superabundance of oil, which somebody (and that somebody is always the farmer) must lose, eliminate the big wrinkle with its concomitants of hair. With our ample facilities, the materials at our disposal and our acknowledged skill, we should produce the best fine, as we already have the best medium, fleece in the world and defy competition. That we should do this seems to me not only to be the dictate of true wisdom and common sense, but a true application of the principle of self-preservation.

The Wheats of the World.

Read at Batavia Institute,
By Professor C. S. PLUMB,
Of New York State Experiment Station.

Although wheat is probably more widely disseminated than any other plant, comparatively few know of the various phases in which it appears in some parts of the world. The farmer of New York State feels that he is well acquainted with *the* wheat plant; yet he who grows hard wheat in Barbary, or spelt among the mountains of Spain, likewise believes his is *the* wheat of the world. But wheats present striking differences in character, and thrive over great areas in each of the grand divisions, as well as on multitudes of the islands of the sea. In its extremes of latitude and range of temperature, wheat flourishes at the following points:*

Latitude.	LOCALITY.	Average winter temperature. Degrees.	Average summer temperature. Degrees.	Annual average. Degrees.
64	Norway	23	59	39
62	Sweden	23	59	37
60½	Russia	15	60	37
30	Cairo	57	88	72
22	Macao	64	82	73
22	Rio Janeiro	68	78	74
23	Havana	71	82	77
21	Bourbon	71	80	77

In North America wheat fields extend far down the Mackenzie river, and the grain is raised with profit at Fort Liard,† lat. 60° 5′ north, over 1,100 miles north of the latitude of Buffalo. In South America the crop is grown as far as the southern end of Chili,‡ in lat. 50° south.

* Balfour's Manual of Botany, 1855, p. 589–590.

† Blodget's Climatology of the United States, 1857, p. 449.

‡ Outlines of the Geography of Plants, by F. J. Meyer, 1846, p. 29.

In altitude of cultivation much depends upon the climate. In France wheat is cultivated to the height of 5,400 feet only;* in Mexico its culture first begins at a height of 2,500 to 3,000 feet, and extends to over 9,000 feet. On the plateau of southern Peru wheat fields of extraordinary productiveness exist at 8,000 feet, and at 10,000 feet elevation, at the foot of the volcano Arequipa, this plant succeeds well.

As harvest time depends upon the country in which the crop is grown, there is not a month in the year in which wheat is not cut. The months for harvesting and the countries are as follows:†

January: Argentine Republic, Australia, Chili, New Zealand.

February and March: East Indies.

April: Egypt, Mexico, Persia, Syria.

May: Algiers, Asia Minor, China, Japan, Morocco, Texas, Tunis.

June: California, Greenland, Italy, Portugal, Sicily, Southern France, Spain.

July: Austria-Hungary, Northern France, Southern Russia and a great part of the United States.

August: England, Denmark and the Northern United States.

September: Canada (a greater part), Norway, Russia, Scotland, Sweden.

October: Russia, Finland.

November: Peru, South Africa.‡

December: Burmah.§

The wheats of the world consist of seven types, all varieties coming under one of these. These may be divided into two grand classes, one in which the seeds are firmly inclosed in the chaff, the other having grains that easily fall from the husks when ripe. All of our American wheat, in fact a greater part of the wheat grown, belongs to the latter class.

The seven types may be named as follows:

1. The common or soft wheat. *(Triticum sativum, Lam.)*
2. Turgid wheat. *(T. turgidum, L.)*
3. Hard wheat. *(T. durum, Desf.)*
4. Polish wheat. *(T. Polonicum, L.)*
5. Spelt. *(T. Spelta, L.)*

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* Outlines of the Geography of Plants, by F. J. Meyer, 1846, p. 293.

† Handbuch des Getreidebaues, 1885, Band II, p. 86.

‡ Northwestern Miller.

§ Ibid

6. Starch wheat. *(T. amyleum, Ser.)*
7. One-rowed wheat. *(T. monococcum, L.)*

But comparatively few have ever seen wheat of any of the above, excepting the common type. It may be profitable to explain the characteristics of each, illustrating the types with dried specimens in the head and grain.

Common wheat *(Triticum sativum, Lam.)* is extremely variable in its character, and consists of a very large number of varieties. The straw is hollow and the grain soft, though some varieties produce a seed that is termed "hard" in the markets. There are both winter and spring varieties, and beardless and bearded, and the grains are classified in the market as white or red. This is the species grown all over the United States, and practically in all portions of the world, where the climatic conditions are suited to extensive wheat growing. The heads assume several pronounced forms, being long, slender, very loose and tapering; or medium long, square, fairly compact and abruptly pointed, or very short, blunt and square at the tip, and tapering toward the base. The heads assume several pronounced forms, being long, slender, very loose and tapering; or medium long, square, fairly compact and abruptly pointed; or very short, blunt and square at the tip, and tapering toward the base. The heads are either whitish-yellow or of a bronze color. Owing to the extensive area over which this class is grown, and the variable climatic and other conditions to which it is exposed, there has arisen a very large number of varieties, and so-called varieties, many of which seem especially adapted to the region in which they are grown. To this class belong the Flint, Mediterranean, Blue Stem, Soule's, Velvet Chaff, Tea, Italian, Lammas, Wicks' and many others well known from a few years ago, back during the century; as well as the Landreth, Rice, Diehl-Mediterranean, Lancaster, Golden Drop, Clawson, Treadwell, Michigan Amber, Fultz, Silver Chaff, and many others extensively cultivated to-day. In the Northern States the grain of these wheats is usually amber in color, and contains considerable gluten, while in the warmer regions of America and other parts of the globe, it has less luster, and more frequently plump, whitish-yellow grains that are much more starchy than that northern-grown. The Lancaster is a good illustration of a dark amber variety, the Landreth of a white one, as grown in the North. Rousselin wheat well represents a white variety from France. Wheat as grown in

the greater part of the United States, has not the beauty of grain produced in warm portions of Europe and Africa. However, California, Colorado and other Western States, grow by means of irrigation, as large and handsome wheat as can be produced anywhere in the world, although that of California contains a comparatively small amount of gluten. Colorado wheat leads the country in large grain, and its percentage of gluten.

Turgid wheat (*Triticum turgidum, L.*) is grown principally in Central Europe.* It is known in England under various names, among which are gray, duck-bill, gray pollard, rivets, etc. Its grain is plump, large and perhaps what might be termed "hunch-backed." It is rarely white, being usually reddish, and the flour is not of very good quality. The head is usually quite heavy and inclines to one side, so that this variety may easily lodge. The heads are bearded, but in all varieties the awns drop off at maturity. The upper portion of the straw is usually solid, especially between the first joint and the head.

Hard wheat (*Triticum durum*, Desf.) is cultivated more or less in the south of Spain, Calabres, Sicily, Greece, Turkey, Southern Russia, Asia Minor, Syria, Egypt, Algiers, Arabia, and some portions of India. I believe it is slightly grown in California. This wheat differs in a marked degree from the common wheat (*T. sativum*). The straw is long and slender, and is filled with pith. The plant stools but little, and the heads are nearly square and are covered with long beards. The seed is so hard and dense that in ordinary milling, difficulty is experienced in grinding it. The grain contains a large percentage of gluten, and makes a yellowish flour that is used in making vermicelli, semoules, Italian pastry and excellent bread. It can not be profitably grown in cold regions, but it is especially adapted to warm climates. This class of wheat when fall-planted at the New York Experiment Station, invariably winter-kills, but if spring-planted it will mature, although unevenly, and the grain is not plump and handsome. It has been the custom of the United States Department of Agriculture to import seed of this wheat from Europe and Africa, and distribute it broadcast. The beautiful grain makes a good impression, and it is labeled winter wheat; yet in every case the plants have been killed by the first real cold winter weather. Indian and white Crimean are varieties so distributed within the past two

* Les Meilleurs Blés, 1880, p. 18.

years. It certainly is a great waste of time and money to send seed of grain from Africa and Southern Europe to the northern United States, as there is no prospect of their succeeding in our climate.

Polish wheat (*Triticum polonicum*, L.) is perhaps the most remarkable species of wheat grown. It is mostly cultivated in Northern Africa, in Egypt and Algiers, although to a slight extent in Europe. The plant does not thrive in most of the United States. It usually lodges long before maturity, and ripens very unevenly, this at least is our experience at Geneva. Further, the head usually contains many sterile flowers, yet when well developed the seeds are large and long. The peculiar and interesting feature in this variety is the head, which is whitish-yellow, large and long, with glumes or chaff that project in a striking manner, beyond the inner chaff, just the reverse of our common wheat; the chaff is more or less bearded. The grain, as in the preceding species, is very hard, and is used for making macaroni and a fine class of pastry. Owing to the handsome appearance of the well-developed seed, this variety has been placed in the market at high prices by various parties in the hopes of swindling American farmers by obtaining a good round sum per bushel for an inferior wheat. Thus far, however, this trick has not succeeded.

The classes of wheat so far described are hulless, the seed falling from the chaff when beaten by the flail or threshing machine. The following are quite different in that the grain is so closely encased in tenacious glumes or chaff that it does not loosen and fall when beaten.

Spelt (*Triticum Spelta*, L.) is the best known of the three classes I propose to discuss. It is a species especially adapted to cold, mountainous, infertile regions, and hence is cultivated mostly by mountaineers in Europe and Asia, as in Lorraine, Germany, Russia and India. The head is loose, narrow, tapering, bearded or beardless, and often exceedingly long; it having grown to a length of nine inches at the New York Experiment Station. As in all wheat, the stem of the head is made up of joints or nodes, from which the wheat flowers grow. When the head is threshed, it breaks in pieces at the different joints, leaving the grain in the chaff as closely clasped as ever. To secure the clean seed, a milling process must be gone through to remove the chaff, which is tough and leathery. There is a white-bearded, and brownish black-bearded variety of

this class, and also a white, beardless one; the beards are short and coarse. From the very nature of the region in which this wheat grows, we can understand that it is mostly cultivated by the poorer classes. Although writers refer to this as an inferior wheat, its grain makes a very fine class of pastry. Spelt is supposed to have been the species of wheat used by the Greeks and Romans,* being termed *Zea* by the former, and *Far* by the latter. *Far* was the food of the ancient Italians, and was used in sacrifice. Haller recommends spelt as superior to any other wheat for pastry and confectionery. In his Herball, published in 1597, Gerarde says:† "It bringeth forth a disordered eare * * * the cornes be wrapped in certaine drie husks, from which they can not easily be purged, and are joined together by couples in two chaffie husks."

Starch wheat (*Triticum amyleum*, Ser.) in some respects is closely related to spelt, but differs strikingly in two particulars, viz.: The spikelets or seed vessels of each head closely lap over each other as shingles on a roof, thus forming a very compact head, with no irregular surface, and the seeds are somewhat triangular or shuttle-form, very hard and thin skinned, quite different from the spelt, whose grain is fairly soft. The heads are bearded, of medium length, and are very smooth, the chaff being exceedingly hard. The grain is used in starch-making. This species can be cultivated in cold mountainous regions where no other wheat can be raised unless we except the next species. It has been grown for a long time in certain infertile regions of Alsace and the Palatinate, in Germany, and in the cold mountains of Switzerland. As grown in America it is a spring wheat.

One-rowed wheat (*Triticum monococcum*, L.) is incorrectly named, as it is frequently two-rowed. This wheat is only grown in mountainous regions, especially in Germany, Hungary, Russia, Spain and France. It is probably the most beautiful wheat grown, as it stands in the field at maturity. The heads are very compact, as with starch wheat, the chaff being ranged in two rows, one on each side, the general appearance of the panicle being somewhat flat. The grain is of shuttle form as in the preceding species, and produces very white flour of good quality, with very

* Miller's Gard. and Bot. Dict., 1807.

† Gerarde's Herball, 1597, pp. 61–62.

little bran. This wheat is supposed to have but one seed in a spikelet, but two are so often developed that another variety has been made called two-rowed wheat.

The straw of the two last classes is rather small, but very erect, and the plants tiller to a remarkable degree — a row of twenty-three plants of the starch wheat averaging 37.26 stalks to a plant, while six plants of the one-rowed average 48.83 stalks per plant. The three last-named classes are remarkably free from disease. A noticeable characteristic of these foreign varieties is their inability to survive our northern winters, hence in this latitude they must always be planted in spring.

Notions About Pigs.

Read at Oswego Institute, March 2 and 3, 1886,
By M. C. WELD,
Of Closter, New Jersey.

There are pigs, aye, and there are radical pigs. I am very fond of pork; and who is not? It always agrees with me, and I agree with it. What meat can we raise upon the farm that can begin to take its place? Fresh, corned, soused, salted, smoked, or simply dry cured with little salt and no smoke (the most crisp and delicious bacon in the world), these are some of the forms in which the flesh of the pig comes to the table. All rich, sapid, nutritious, digestible and healthful. Then sausages in endless variety tempt the palate, and we are forced to divide our encomiums between the pig, the sausage-maker and the cook. Every cook will speak a good word for the pig. What will take the place of lard? Drippings, suet, olive oil, butter, all fall far short in the matter of general culinary usefulness. The larding-needle would hang useless, and the delicious flavor of salt pork would be missed by the epicure from a score of dishes. In fact, the cook would be all at sea without pork. What old soldier does not remember with affection the slices of raw salt pork which, with hard bread, formed the three days rations packed in his haversack, for many a short and sharp campaign? Why do I eulogize the pig before a body of farmer folks? Because, in some form, pork is our standby. Fresh pork and sausages in winter with buckwheat cake accompaniments, hams, shoulders and bacon in spring and summer until we begin to kill the occasional chicken, and salt pork the year round. Nevertheless, we listen to cranks reviling the pig, talking about scrofula, about the Jewish sanitary laws, about the unhealthfulness of a pork diet, and all that, when the three healthiest, heartiest, and most active classes of people in the world — farmers, soldiers and sailors — eat more pork than any other folks.

I think we are pretty well agreed about pork, as pork, without argument. Let us regard the pig for a moment as a farm laborer,

and from a strictly productive point of view. Prolific beyond anything, except birds and rabbits, an omniverous feeder, not fastidious — a first-class scavenger — I hate to use the word "scavenger," but there is no other. It is not a tasteful word, but a very useful quality. Everything in which there is any nutriment is to him meat or drink. "All is fish that comes to his net," in very truth. We have here the most rapid conversion of things worthless (valueless or worse, actually injurious, like the grubs and angle-worms and beetles in the orchard) into live weight of very tangible value. Even poultry work no more rapidly, and are vastly more discriminating and fastidious as to what they eat. Thus his esthetic faults are his practical merits. It is, however, hardly fair to inveigh too strongly against piggy's good taste, for so far as that goes, though he accommodates himself to circumstances, I doubt that he stands ever ready to take the porcine equivalent to the London journeyman's oath, known among the guilds as "the Highgate oath," or as being "sworn at Highgate." You remember the "'prentice," when he became a real "jour.," and started out on his travels, swore never to drink small beer when he could get ale, never to wear linsey when he could get cloth; never to take a shilling when he could get a crown, and never to kiss the maid when he could kiss the mistress. For his pigship, it would be "never to drink dirty water when he could get clean; never to eat garbage when he could get grain; never to sleep in the mire if he could get a dry bed."

The pig's usefulness as a mixer, turner and finer of the manure heap needs only to be alluded to. There seems to be a value given to manure, worked over by pigs, which neither the theory of the philosopher nor the crucible of the chemist can account for. Yet it is positively there. Corn finds it, grass laughs at its odor, grain-fields grow green and tiller and shoot to its enticements, and the farmer's heart rejoices. Thus is the pig indispensable to the agriculture of the country, not less to the household economies, and not less to the great commercial interests of the nation, to which I have only time to make this passing allusion.

Now, as I have already said, there are pigs and *pigs*.

What makes the difference?

We all see it; we know that there is at least double the profit in keeping some kinds of pigs that there is in keeping others. Practically, how can we make choice of breeds that will pay best?

To answer this question we must look a little into the origin and tendencies of breeds of domestic swine. The wild hog of Europe is no doubt the stock upon which the modern breeds have been built up, but the commencement of improvement is too far back in the mists of the past for us to say how it was effected — probably through the swine of Asia and the Levant.

Domestic and semi-domestic swine have been common all over Europe from the earliest historic period. The excellence of the hams of Westphalia is said to be due to a large infusion of the blood of the wild boar. These hams are broad and flat, rather strong in bone, with a thin external layer of fat, and, if the pig had been rapidly fattened, most beautifully marbled and interlarded with fat streaks running through the lean, just as we often see in good Berkshire hams; and, no doubt, in the Berkshires it is attributable to the same original source. The notable difference being in the thicker layer of outside fat, and in the much greater thickness of the ham itself.

Pigs of any breed, when allowed to run wild, to fight their own battles — to fight the battle of life, "root! hog, or die" — revert rapidly towards the wild type. Their heads grow long and large in proportion, their necks lengthen, their shoulders widen in proportion (or out of proportion, according to our notions), their hams grow flat and their bones strong. With all this, the spines of the neck and between the shoulders elongate and are encased in powerful muscles, which all concentrate their power in the snout, and are available both for the steady upward lift in rooting, or with the powerful lateral muscles attached to the ribs and shoulders to give those tremendously quick and powerful sidewise sweeps of the jaws which give fearful efficacy to the ripping, tearing thrusts of the sword-like tusks with which the jaws of the old boars are furnished. Thus the characteristic of the wild and feral types which is most conspicuous is their build for rooting and fighting.

As a fighter, the despised hog is one of the grandest types in the animal creation. True, he needs age; the soft-skinned pig runs, and so long as he has no family responsibilities, the young male makes only a craven stand; but a scarred veteran, whose shoulders bear the marks of scores of contests with his own kind, will face his enemies, toss dogs, mortally wounded, right and left; snap the tough boarspears and gnash his vindictive, savage hate upon his foes, until trusting to his exhausted strength, some one bolder than

his companions, and with a strength to pierce the tough hide with the long boarspear, gives the *coup de grace*. Let us look at him. He seems half head. The long wiry black bristles make him look higher at the shoulders than he really is, as well as narrower, for they combine from each side in a ridgy mane. The folds of skin on his neck and shoulders are inflexible, like, in a small way, the plates and creases of a rhinoceros' hide. In fact, no one can examine the hides of these two animals and not recognize a family likeness. To the wild boar, this tough, ridgy hide, which covers his most vulnerable points, head, jowls, neck, shoulders and ribs, is really plate armor. Beneath this armor plate is a layer of fat, yielding to blows, and if the hide be penetrated by the sharp tusk, defending the vulnerable muscles and vitals from injury. If Captain Ericsson, of undying fame, had actually sought a model for the almost invulnerable sides of his Monitor, he might have had one of the sides of the wild boar. For aught we know, he actually had this natural construction in view, for he was and is an ardent student of nature. The plate armor of the original Monitor, and of all its kindred down to the most modern ironclads, is backed by several feet of solid oak, as the pig skin is by fat.

The hams are inconspicuous, compared with the parts useful in battle for offense or defense. They are flat, long and moderately broad, covered with a thin hide and not heavily haired. Even in running they have perhaps for years been unused. Hence with the chine the hams have always been regarded as the choicest parts of the pig.

With us we cut all the meat we can into the shoulders, split the backbone, trim off the little thin "spare ribs," and hardly know the pork chine by name. In Virginia, however, and parts of the South where the pigs are more than half wild, we find flat, delicious hams, much like those of Westphalia, and we find the pork chine taking a place of honor among joints, as it does in those countries where the wild boar is still hunted, and his flesh found common in the markets in the autumn.

I have been thus particular in calling attention to the wild boar and his build, not because he is a model for modern pig breeders to follow, but because in my own judgment of a pig or of a breed, every similitude of any part to the wild boar is a condemnation. Wrinkles in the skin, tough hide over the shoulders, a comb of bristles or any bristles at all, the obvious possession of a neck,

greater width at the shoulders than at the hams, a short body with the hind-quarters subordinate to the fore, a heavy head, a long snout, close-set eye, heavy ears, jeweled jowls, and withal heavy bones, all show bad blood, bad breeding, a tendency to revert to a bad type, and promise little profit in feeding.

We all value prepotency in breeding animals. It is ten times as valuable in breeds — in fact it is all that makes a breed. A breed that shows a tendency at all general to revert to the wild or to any other type is no breed. It may be made one in the course of a hundred years, but it is no breed now. The art of pig breeding long antedates the annals of the best English breeds of pigs. The pig of China, at any rate the one best known as the pig of China, has a prepotency of breed of at least 2,000 years. The Neapolitan pig, a perfect beauty he is too, has a prepotency quite as intense. Such pigs need no pedigrees, if by any accident an outcross is taken once and the blood bred in with the herd, in a few generations it is swallowed up so completely as not to have a trace. Much of this sort of breeding would, however, soon undermine and destroy even such potent breeds as the Chinese and Neapolitans.

I am a great admirer of the Devon breed of cattle, for which Connecticut was famous in my boyhood. They were, so to speak, my first love. I loved their cherry-red coats, their spreading white horns, their compact cylindrical bodies, their sloping shoulders, clean necks, level backs, broad loins and deep flanks. Early maturity was a great desideratum. This was not a general characteristic. Well, at one time the papers were praising a fine young bull recently imported, and the property of Randolph Lindsley, of Meriden. He was one of the great attractions at the State fair. I saw him and felt sick. He did not look like a Devon. He was of a pale, short-horn, red color, had flat, waxy horns, turned partly back, and a short-horn look all over. He had early maturity, however, and in spite of his short-horn blood, a perfect pedigree. His services were in demand, and I mourned to think of the effect on the beautiful pure-blooded Devons of the State. Year after year I saw his calves pale red, with great patches of white on their bellies; but after one or two generations, the potency of the breed asserted itself, the old color came back, the horns were uninjured, and no perceptible harm had been done. That is the way with all strong breeds. In breeding cross-breeds or composite breeds, the breed having the strongest potency constantly asserts

itself. The progeny, generation after generation, grow more and more like the strongest member of the cross, while the points obtained from the weaker breed or breeds are gradually lost, unless they are cultivated with assiduous care.

I need only to direct attention to the changes which have been taking place in certain of our most common breeds of swine. The Chester whites have been gradually changing; losing their coarseness and big ears and big heads, and taking on more and more the Yorkshire type, with less breadth of shoulder, finer hair, shorter faces, etc. A gradual change not due to selection, though helped by it, but due to the domination of the stronger blood. The Poland Chinas, in the same way, have almost become Berkshires, and were it not for the cultivation of the long, straight snout and face, after a few years only an expert could tell the difference. I used to think before pedigree times that some of the famous breeders took what they call in England "a stolen cross" with the Berkshire now and again, but have given up that idea. There is Berkshire blood enough in them to convert the whole race — only give it time and not too much interference.

This is the case with the best of our so-called "American breeds" of pigs, and why? Simply because the most potent blood is good, and, of course, dominates. With the inferior breeds, which as cross-breeds spring up, and for their size, or for some unknown merit, are forced upon public notice, reversion takes place all the same, but with characteristics clearly indicative of the tendency to go wild again.

Are we ready to make choice of a class of pigs for farmers' use? One is needed which is prolific; one which will grow quickly; one which will be always fat enough for the knife; one which will make the most economical use of food; and, last but not least, one which for smallness of offal parts, development of choice parts and for quality of flesh leaves little to be desired. Is this perfection? No. Is it an ideal? No. I advocate now no particular breed, but a great principle. Such a pig as I describe, only more nearly perfect (for I pass very briefly over some of the most important characteristics) can be made to order on every farm in the country. Why should we not do it?

It is easier to answer the question, why do we not do it? It is simply because we persist in breeding *mongrel breeds* — save the mark — and from males of mongrel breeds. Several years ago I

owned a pair of imported Neapolitan pigs, and exhibited them at a State fair in this State. At the same show Joseph Harris made a fine show of his so-called Essex pigs, now known in England as small blacks. In this exhibit were several pens of pigs competing for the specific prize offered for the best pen of five Essex pigs, and one pen younger than the others, much larger, equally fine in every useful point, not entered for competition. People doubted their age and the wise ones were sure there was some trick. Mr. Harris and I were going over his exhibit together when we came upon this pen. (Now, this principle is a hobby of mine, and you must let me be a bit personal, not egotistical). "Good," said I, "that is grand; here you show what Essex blood is good for." He was pleased at my enthusiasm, but said: "How so?" "Why," said I, "they are *grades*." "You are the first one who has recognized them as such," said he, "and the judges wanted me to change the entry, and to give them first prize." That is the principle — get at once all the good of a well-bred sire. In this case it was the potency of 2,000 years of Neapolitan selection, modified by sixty generations more or less, of careful English breeding, combined with the vigorous health, the strong nutrition, and prolificacy of a big, common or cross-bred sow.

Now, it is plain that anybody can get up a cross-breed of pigs, or of sheep, or of chickens, which, if he can only talk up, loud enough, or write up, or get some newspaper correspondent to write up, and with which he can win a few prizes at county fairs, he may dub with a high-sounding name. He may advertise them for sale, and, when breeders multiply, start a "herd register." All this will not make a breed, even if it have a scale of points, or a standard of excellence. The strong breed, with its unweakened potency, will gradually assert itself, and the "breed" will melt away as scores have done.

What shall we do?

Simply find out definitely what we want, and breed accordingly: but confine ourselves to pure-bred — "thoroughbred," if you please — males. Of course some persons, skillful breeders, must raise the pure breeds, but this is not at all the thing for farmers, who make pork for profit, to do. I do not hesitate to say that however profitable the raising for pork of any pure-bred kind of pigs may be, the raising of grades ought to be much more so.

The true breeder's skill up to this time has, it seems to me, been

exercised successfully in the formation of but few breeds. Prominent among those most prominent are the "small whites," or small Yorkshires, of which the prominent families, perhaps all of which have been admitted to registration, are a thoroughly well-bred race.

With these the middle Yorks are almost identical, but have been bred for size. These are white pigs, of course, and owe their excellencies largely to the former free use of Chinese blood. Close to these come the small blacks, recognized as "Essex," in this country; but this name is almost unheard in England, where the Dorsets, Sussex and Suffolks represent the principal families of small blacks. These gain their thoroughbred characters from the Neapolitan cross made by Lord Weston.

We may still go to the bay of Naples, as Mr. A. B. Allen did about the year 1868 or 1870, and get the same high-bred pigs, with the thinnest skins, the least hair, and the sweetest of sweet pork; in fact, more like chicken than pork, as all travelers in the vicinity of Naples testify.

Next to the small blacks come the Berkshires. They might be called small, middle and large, for they are easily so bred. This is really a modern breed, but it has a famous ancient basis, and this has been well built upon, or "topped," as breeders say. The Neapolitan takes a hand here, so does the Chinese, and good breeding has done the rest. The superb quality of the flesh, which it imparts so well to its grades, its grand vigor and constitution and great prolificacy, are its strong points. Next to these in point of breeding and well-bred characteristics comes large Yorkshires. I do not like them much; they have less coarseness than other big breeds; are large simply because they keep on growing after the smaller breeds stop, which indeed is true of the large pigs. They are, however, the best of all big pigs to cross upon large, prolific, hearty, big milking sows, such as Chester whites or Poland Chinas, and the progeny is, so to speak, "splendid."

If any one can name better pigs than these for real use, white or black, large or small, that breed truer to points, that deviate less from the standard, I do not know them. If any one thinks he has a so-called breed of pigs that are more economical or better pork makers, I have not the least doubt that well-bred half-bloods of almost any one of these breeds, with the same care and feed, would beat them in weight at nine months old in a way to astonish the inexperienced.

Q. Do we understand Colonel Weld to condemn all American breeds of swine?

Colonel WELD.— Certainly not. If there is an American breed I wouldn't condemn it; if it is an approximation to a breed I wouldn't condemn it. It is an improvement on something; so far as it goes it is good. But it should be understood by the farmer that he had better be satisfied with nothing but the best, and no American breed is the best. The American breeds, so to speak, are cross breeds — composite breeds. We can get better by going to the source and making a cross ourselves. If we want pork take a fine-bred big male, which we know fattens quickly, grows rapidly and quickly matures, and cross him with a prolific sow that has plenty of marks of big litters, and he will have a pig which will combine the virtues of both parents in the first generation.

Q. What constitutes a true breed of pigs?

Colonel WELD.— Just what constitutes a true breed of anything. A breed is something which will perpetuate itself with a moderate amount of care. A breed is no breed, so to speak, if it tends to revert to its original or wild state. That is no breed; it is a composite breed from two or three others, with a constant tendency to revert to one of the strongest of those breeds. But a breed is one that you can depend upon, so carefully bred that you can depend upon its being like the parent stock, and only requires to be bred to certain points with a view to their improvement. That is a fixed breed. No breed is absolutely fixed. There is a tendency to reversion in everything except the absolutely wild; that has reverted and run wild until it can not revert any further. The original wild breed is of course the breed of nature; an artificial breed is one which will maintain itself.

The Pig on the Farm.

Delivered at Oswego Institute, March 2, 1887,
By Colonel F. D. CURTIS,
Charlton, N. Y.

Mr. Chairman, Ladies and Gentlemen.—The subject assigned to me, the pig, is probably the most uninteresting subject that can be brought before any audience, even of farmers. Now, that is not so much the fault of the pig as it is of the farmer. It is one of the queer things of this world that people take so little interest in and have so little regard for what they eat, where it comes from, how it is made, and that is the case with the pig. People buy pork, they eat pork, and they never seem to think where it comes from or how it is produced, if they only have it, and hence the little interest the pig possesses for an audience of farmers. It ought not to be so. The swine of this country are really the most important domestic animal we have. The financier is more interested in them than in any other because the swine products pays the largest part of foreign exchanges. There is more consumption of swine products, in this country than any other product, hence there should be more interest in swine, as a matter of food and as a matter of profit. Such is not the case, however.

I shall speak to you now in my farmer way of the hog as a farm factor, and in regard to the sanitary condition pertaining to swine-growing, and the marketing of pork products. The greatest question with the farmer of the State of New York to-day is fertility. How can the fertility of the soil be increased so as to improve the land in its productive capacity? You have all given your opinions about bringing about this result, and most of you seem to think, and I am sorry to see it, that the easiest and best way to improve the fertility of your land is by the purchase of commercial fertilizer. I don't agree with this, but I am not going to discuss the principles involved in their application in connection with other means of improving the fertility of the soil. I am simply going to take up

the question of the hog as a farm-factor, to produce that desirable result. I have made a good many experiments in this direction. I have launched out quite widely in the swine interest. I have done so for the purpose of endeavoring to improve the fertility of the farm. I have found that the hog will enrich the land faster and better, that is, make it better for growing all kinds of crops, than any other animal. And not only that, but the application of the manure that comes from the hog is the most lasting of any that can be had. These are fundamental principles, there is science and philosophy in them, but I simply state it, a farmer to farmers, as a fact. As a practical illustration, I had a large field of clover and I raised over 100 hogs, with those that I wintered, and turned them into this clover field and they ran there during the summer and ate clover and grass all they wanted, and the result was that this field, which wasn't in anything more than an ordinary condition of fertility, the next year produced, a portion of it, the largest crop of fodder corn ever grown. That crop I followed by a crop of corn for grain, which was a magnificent crop. That was followed by a crop of oats, which was one of the largest crops I ever grew. That was followed by a crop of wheat and during the fall was again seeded down. The wheat was fine, and the grass promises to be as good as before. Now, that is one illustration. There are other uses to which swine can be put upon the farm in the way of advancing the fertility of the farm besides this. I have brought up the productiveness of an old orchard, to the growing of a fine crop of fruit by pasturing the hogs in it and allowing them to eat off the grass that grew from year to year. The renovation of that orchard has all been owing to the benefits of those hogs running in it and eating the grass. I don't believe that in New York we can raise swine and keep them in the pig pen the year around and make them profitable. I don't want to be understood as advocating any such method as that. It is the most expensive way in which swine can be reared; it is the most productive of disease. Swine should be kept upon the ground during the entire growing season of the year; should be kept in the field if you wish them to remain the most healthy. There should be rotation in swine, from one field to another. Change them from field to field until they have gone all over the farm. That is the system I have adopted, bringing up each field in succession to a high state of fertility. There is very little trouble in keeping hogs in these fields. Swine should never

be turned into a field until the fence has been thoroughly repaired so they wont get out, because once they succeed in getting out it is exceedingly difficult to confine them after.

Now, I will speak of the sanitary condition of swine. They should never be kept in large herds. That is just the reason swine are sometimes so unhealthy. It is impossible to keep a large number of swine together without disease breaking out among them. The same sanitary regulations will apply to swine that apply to people. If a man would manage his pigs successfully, scientifically, he must stop and consider first what is good for himself. What kind of sanitary condition, and what kind of food would be best for himself, and then apply it to his swine. To be ignorant of those principles, and to conclude that a hog will live on anything, and under any circumstances, is a great mistake. That is the mistake the western people make. You should avoid those things. For you must be very cautious in the management of your hogs or you will bring into the State those infectious diseases that exist in the west, but do not exist at present here, and never will if you observe and use proper judgment and sense in the management of your hogs. There is a great variety of diseases to which hogs are liable. They are liable to most all the diseases that affect the human family, except some of those acute nervous disorders which are peculiar to fashionable society, and they should have such sanitary treatment as will protect them from these. They shouldn't be confined in dirty, filthy quarters; they should have pure air, pure water, and be allowed out of doors during the whole growing season.

Now, with reference to the marketing of the swine product: The pig is an omnivorous animal and will thrive as well upon grass as they do upon grain and flesh. If you put the pig in the field to eat grass only, you feed him the cheapest food, and in that way make the cheapest product, and besides all that, you make the healthiest product. The healthiest product to put upon the table is pork made in the field by eating grass. A pig, fed upon grass and vegetables, wont be as fat but it will be more healthy, and more in demand in the market than overfat pork, fed exclusively upon corn. New York State pork brings a higher price than that from the west, simply because not so excessively fat. We give a greater variety of food to our hogs in this State than they do in the west, hence the pork is better suited for consumption, it is better flavored, better food and brings a higher price.

In marketing pork farmers make a mistake, in that they don't try to help themselves more. The farmer can be a great deal more independent than he is. The farmer should be the most independent, highest toned, best man on earth. If he isn't, it is his own fault. The farmer fattens his pigs and when they are ready to butcher he goes down to the city and walks into the store of some sharp over-reaching butcher and says: "What will you give me for my pigs?" That is an every day occurrence. The butcher looks at the farmer and immediately takes in the situation, and plays with him awhile and finally buys his pigs at his own price. The farmer brings them to town and the butcher sells them at a profit of not less than 100 per cent, often more, over what he has paid the farmer. What is the farmer doing all this time? Fooling around home, or down to the store or tavern, or he is standing around his barn doing nothing. What would I have him do? Kill those pigs himself. He should find out how to make the best hams, the best shoulders, the best sausage, the best bacon, and he should put his pigs into those several merchantable products, go down to the city like the independent, high-toned man he ought to be, and he should go into Mr. Jones's store and say I have got some of the nicest hams, some of the nicest bacon, some of the nicest spare rib, or whatever it may be, that I have made on my farm. I fed the pigs myself and know they were healthy, I know the food that was fed them was the best that could be, and I want to sell you some of this product. I will sell it to you for ten or twelve cents a pound, twice as much as the butcher paid him. If Mr. Jones is wise he will know that is what he wants, and he will take some of this product at a fair price, the farmer being a pleasant customer of his and thus a reciprocal feeling will be engendered beneficial to both. Thus let him go around and in the same way dispose of his product at the highest price, and realize twice as much money as he would to sell to the butcher, and still these men each buy for less than they would have paid the butcher.

Q. What was the manner of pasturing those hogs that they did not root?

Colonel CURTIS.—I turn my hogs out in the field and they don't root much, I don't have much trouble. That is more often a bugbear than a reality. If hogs find a place where there is a lot of grubs they will root those grubs out, that is all right. If they are on the ground all the time they wont root much. You can take a

harrow in the fall and harrow it over and sow on grass seed and the next year you don't know the difference, in fact it is improved.

Q. What size hogs do you turn out into this pasture?

Colonel CURTIS.—I turn out all sized, hogs and shoats, and little pigs. You can keep little pigs growing in that way. You are not aware of how much grass a little pig will eat; turn a little pig four weeks old out into fresh pasture, and it will live and grow on grass without anything else to eat.

Q. What time do you take to market them?

Colonel CURTIS.—That depends on circumstances. If I want them for the early market of course I commence feeding a little sooner. But for a late hog, the first of September or October. They should be fed about two months, supplementary food enough to put them in good condition, keeping them out in the field all the time. Don't put them in a pen. Hogs suffer from dyspepsia just the same as a human being. When their stomach is crowded with corn they suffer all that a human being does with an overloaded stomach. Hogs die from inflammation of the stomach and bowels.

Q. Last spring I put my winter shoats out in the pasture, weighing about 250 lbs., and by giving them a little corn I got them up to 350 lbs.; my spring pigs, by extra feeding, I made weigh as much. Which were the most profitable?

Colonel CURTIS.—The point is, farmers don't think enough. It is not how much a pig weighs but how much that weight costs, that is the point. If I take two pigs and turn them out to grass and they come to weigh 500 pounds it don't cost me but a trifle, don't you see, and I am making a gain. You can take those two pigs and put them in a pen and feed them solid corn all through the season, and make them weigh 600 pounds, but your pork has cost you a good deal more than mine, and you have been losing money while I have been making money. It is not a question of weight, it is *what that weight costs.*

Q. What breed of hogs do you consider the most profitable?

Colonel CURTIS.—Well, sir, I consider all breeds profitable if they only have the requisite amount of length and breadth and stamina and constitution to go into the field and take care of themselves.

Professor ROBERTS.—I want to say that Colonel Curtis *paints his hogs red* (Duroc Jersey), and to ask him if he has experimented any in regard to feeding for lean meat?

Colonel CURTIS.—I want to say right in that connection of marketing your own products, that I have killed this last year over 100 hogs, and there is a Dutch butcher in Schenectady to whom I sell, and he pays me half a dollar more on the hundred than he does others. The other day I met a gentleman and he said: "Colonel, I have been buying a couple of your hams, and my wife says they are the best hams she ever had in the house." "Where did you get them?" "Why, I bought them of the butcher you sold your pork to." You see that man paid for those hams a *price, big price* over and above the market price, simply on account of the quality. Those hogs were fed particularly to produce an abundance of lean meat. Those hams are not excessively fat, but there is a preponderance of lean meat from running out to grass. They were fed wheat bran, wheat middlings in connection with vegetables, and no corn at all.

Q. Have you ever experimented with what we call cob meal corn, for feeding?

Colonel CURTIS.—I should prefer to feed corn ground with the cob than with no admixture, but I don't feed corn to my hogs.

Mr. WOODWARD.—I should much rather have the corn ground clear, and mix bran or oil meal with it. The benefit derived from the admixture of cob is not because of value in the cob so much as because of the greater extension of the meal—because of the greater bulk. Now if we extend or dilute the meal with an equal quantity of bran, we shall get the same advantage and the greater nutritive value besides, and then the nitrogen of the bran helps to balance the ration. We don't properly appreciate bran as a food to mix with corn meal.

Draught Horses of Scotland and England.

Written for the Annual Meeting of New York State Agricultural Society, January 19th, 1887,
By CHARLES COWIE, M. R. C. V. S.,
Ogdensburgh.

Notwithstanding the American farmer's instinctive love for horses and horse rearing, and although he has earned for himself a world-wide reputation for the breeding and rearing of trotting horses, he has singularly failed to give any marked attention to that important and lucrative branch of farm industry, the rearing of draught horses, which in Great Britain and Ireland and other European countries adds very largely to the profits of the regular routine of the farm. The money annually paid into the foreign draught horse breeders' pockets, might well be put into his own. No other country in the world possesses such preëminent advantages for this branch of industry as the United States. Not only is the American farmer placed at great advantage by his wide and abundant pasture fields, but, compared with Great Britain, the production of animal food costs considerably less. Really good draught horses are comparatively few in this country, and at all times command high prices, and for obvious reasons will do so for many years to come. As a law of political economy, the demand for an article is the natural stimulus for its production. This demand for a heavier class of horses is ever increasing with the growing use of very heavy horses in our cities and the foreign demand ever calling for all we can spare. If this class of horses were more extensively bred the demand for them would naturally be greater because of the increasing foreign market, while the cost would be lessened.

The most important breeds of draught horses raised in England are the English-shire or cart-horse, and the Suffolk-punch.

In Scotland the horses range in size from the small mountain ponies to the large breeds of the plains and cultivated country.

It is in the Lowlands of Scotland that the Clydesdale horses are so extensively reared.

The part of Scotland which had early become the most distinguished for the production of the larger horses for draught, was the county of Lanark or Clydesdale, as it is sometimes called. This district intersected in its whole extent by the river Clyde comprises a large portion of that vast field of coal to which Scotland owes its existence as a manufacturing country, and contains within its bounds the city of Glasgow. The rapid growth of this city and the prodigious land-carriage in the rich mining district connected with it created a demand for horses of superior size and strength. The horses required were those which should combine with weight of body a considerable degree of muscular activity. Breeders have made careful selections and only bred from those animals having the properties required, until a breed has been produced with well-defined characters. It is termed Clydesdale, because most extensively bred in the district of that name.

The Clydesdale has a manifest resemblance to the black horse of Flanders and the Netherlands; and current tradition refers to an importation, at an early period, of a number of Flanders stallions to the neighborhood of Hamilton by one of the dukes of that name. It is, however, believed that horses from different sources have been from time to time introduced into this part of Scotland, and that thus the breed of Clydesdales is really of very mixed lineage, although its distinctive characteristics have been communicated to it largely by the blood of the black horse of the continent. This Continental black horse, as a race, may be found unmixed in the countries of the lower Rhine, the Meuse and the Scheldt, comprising the States of Holland and the kingdom of Belgium, and in these countries now, as in ancient times, the black horse retains the weight and size which are regarded as characteristic of its race. Its typical form is round and massive, the chest is wide, the neck is strong and muscular, the limbs short, stout and hairy. It possesses physical strength and safe action, but is wanting in lightness and speed.

Few of the ancient black horses now exist in England. The modern English cart-horse retains some of the general characteristics of the preëxisting race, but greatly modified. His color is usually of a sooty black, or dark bay or brown, with frequently a white star on the forehead, and quite generally one or more

white feet, and part of the legs, and not unfrequently the muzzle, white. His body is massive, compact and round; his limbs are stout, chest enormously broad, and his neck and back are short, mane thick and somewhat frizzled, and his legs, below the knee and hock, are hairy down to the heels. His whole aspect conveys the idea of great physical power without corresponding action. The main defects of his conformation and temperament are his too great bulk of body, and want of action and mettle. For a pull with a heavy weight he is admirable, but he steps out short and is slow in his motions. He is, however, in extensive demand all over the south of England for field labor, for wagons and heavy carriages of all kinds. He is to be found in great numbers in all the larger cities of England and seaport towns, where he is used for the transport of heavy goods at wharves. In London, where the largest and finest are in demand, he presents for admiration his massive form, going slow but sure. At the age of two and one-half years the colts are often seventeen hands. They are used in the plow from that age until four years old at which age they are employed for all kinds of labor.

The English cart-horse undoubtedly affords the basis for the production of a valuable breed of horses suited to the labors of the field and heavy draught of our cities. His great defects, however, are his extreme size and want of activity. A draught horse should, along with the form indicative of strength, possess length and depth of the posterior extremities with the form of shoulder which shall allow him to step out at a good pace, in which particular the cart-horse of England is inferior to the Clydesdale of Scotland.

The Suffolk-punch breed of horses from possessing certain peculiarities have been regarded for many years as a distinct breed of horses. They are termed Suffolk-punch from being bred in the county of Suffolk and from the stout or punchy form distinctive of the individual. They were originally distinguished by their light dun or sorrel color sometimes deepening into a chestnut with lighter colored mane and tail. They are a useful kind of horses, and though slow, are possessed of good endurance and moderate gait. For a long period they have been crossed with other varieties, so that now it is rather difficult to obtain a Suffolk-punch in a state of purity. They were a hardy race and capable of subsisting and thriving on meager fare. They are full of grit and perform their

work with great determination and vigor. Originally they were not of very attractive forms, having large heads, coarse muzzles, low and cloddy shoulders, short necks and limbs, straight backs, and well-developed haunches and loins.

The modern breed, are more attractive and have better action. Their hardiness and temperament have, however, to a certain degree, been diminished by crossing with the horses of Yorkshire and Durham. The dun color is less frequently seen, giving place to brown or bay. They are superior to the English cart-horse in activity and endurance, but the demand for large horses with massive forms without respect to useful qualities has had the effect of curtailing their market value in the large cities of England.

The Clydesdales as now bred, stand on an average sixteen hands. Their color varies considerably — black, brown, bay, and also gray is not unfrequently seen. They have long shaggy manes and tails, broad foreheads, short, thick necks, thick and strong withers, massive shoulders and broad, capacious chests, deep and well rounded ribs, loins and croup long and broad, buttocks deep and well let down, legs short, thick and well set under them, abundantly furnished with long, silky hair from the knee and hock down to the foot, large knee and pastern joints, short and straight hocks, broad, slightly flat feet. They are longer in body than the English cart-horse, less weighty, compact, and muscular, but have better action, step out more freely and are more useful for ordinary labor. The long stride characteristic of the breed is partly the result of conformation and partly of habit and training. No such loads are known to be drawn at the same pace by any other kind of horse in the kingdom, and in the labor of the field these horses are found to combine activity with the physical strength required for draught.

The breeding of Clydesdales is not now confined to the county of Lanark, nor even to Scotland, but they are raised in large numbers in both England and Ireland. In the western highlands of Scotland they never attain to the size found in the lowlands and the rich and fertile valleys of the east, midland and southern countries. They are, however, still produced in the greatest numbers in Lanarkshire. They have good feed and plenty of it when young. They are taken up for work in the fall of their second year, when they are required to do a little plowing, but are not generally put to cart work until three or four years of age. These

horses are disposed of in great numbers at the Glasgow, Rutherglen and other fairs, in the district, and are taken in large numbers to the south of England and north of Ireland. They have been and are exported largely to all the British colonies, have been imported considerably into the United States, especially to some of the Western States. The actual cost of breeding and rearing a Clydesdale colt in Scotland to maturity is somewhat difficult to estimate. Without, however, entering minutely into details, it is safe to put the average cost to three years of age, including services of sire, loss of work, and adding five per cent for loss of foals, and two per cent for mares, amounts to $130. From the age of three years to the time they are sent to market the expense of keeping is more than covered by the work they do. The market value of a five-year-old is on an average $300. The average daily allowance of hay to a full-grown draught horse, with a moderate amount of work, is fourteen pounds, with sixteen or eighteen pounds of various other kinds of food, such as corn, peas, beans, barley, oats and roots.

Let us hope that before a great many years pass, that this great nation will have become fully alive to the importance and profit accruing from the breeding and rearing of draught horses of a superior class, and as success has so manifestly crowned her efforts in the rearing and training of the trotting horse, so also will it with equal certainty the draught horse, when equal attention is given to the business.

Agricultural Botany.

Prepared for Ithaca Institute,
By Dr. E. LEWIS STURTEVANT,
Director of New York Experiment Station.

Agricultural botany, as distinct from botany, has not as yet received the deserved recognition of botanists, and my own work toward establishing such a distinction has not by them received much support or attention.

The subject of agricultural botany can be treated under two sections: The first, classification and description; the second, the physiological features which bring under review the changes in our cultivated plants which may be produced by man, and the limitations to those changes.

The need of a classification of agricultural plant-varieties is immediate and pressing. In the present state of confusion the difficulty of identifying varieties is so great that distant investigators, of like problems affecting like varieties, can with difficulty be sure that their results are comparable on account of the uncertainty relating to the indentity of the varieties. In the case of seedsmen's seeds, such is the confusion in nomenclature that it becomes impossible in many cases to recommend one variety as possessing desirable features for the grower, on account of the liability that the grower will not be able to obtain the variety intended, because the purchase of seed can be only by name. To illustrate this point; some years ago I sent to nine seedsmen for King Philip corn, one of the most widely distributed and most distinctive varieties that we possess, and in return I received what might have been described truthfully as seven different varieties sold under the name of King Philip. Similar instances have been so numerous in my experience that it sometimes seems as though confusion in the nomenclature of agricultural seeds was the rule and correctness the exception. Before accurate and reliable work

can be done in the study of varieties we must be able to formulate experiences which have been gained under various conditions of climate, exposure, and treatment, and the basis of these studies must be established upon the certainty that the various observations have been made upon, actually the same variety. Otherwise our conclusions are worthless.

That an agricultural botanical classification of cultivated varieties is possible, I can not doubt. That our cultivated vegetables present characters suitable for a classification seems evidenced by their permanency, which my studies have shown they have held, for several hundred years in spite of conditions of climate, culture and treatment. These characteristics, which I shall call essential, seem sufficient to enable us to divide our cultivated vegetables into groups which bear like relationships to each other as do species in nature, and within these groups subvarieties can be formed founded upon horticultural characteristics which, although not always visible, yet can be easily determined by trial. The botanical characters of the groups can be founded upon form, color and habit of growth. The horticultural characters embrace points which may be grouped under the terms size, earliness and quality, together with their hereditary adherences. As the word *race* is used and defined by botanists, it applies both to groups of variety and to varieties; hence it can not be used in this connection, and I therefore have substituted the word *types* to cover those series of horticultural variations which are included within a form-group.

These types seem to be extremely persistent. We have no record of their origin in numerous cases, but in many cases we can trace them directly to nature, and it seems a most probable hypothesis that they have originated through the slow course of natural selection rather than through any immediate agency of man. Thus the types of our cultivated varieties of dandelions may be found in our fields. Species which are variable in nature when introduced into cultivation have presented numerous types to culture. Species which are not variable in nature have offered but one type to culture. This last proposition receives excellent illustration in asparagus, a plant which seems to have been as perfected in the Middle Ages as at present. It was under cultivation long before the Christian period — even from time immemorial — and yet, notwithstanding its popularity and the care and changes of culture during two thousand years, it remains so constant that

the records do not indicate even a subvariety change during all this extended period.

In the case of those plants of such ancient culture that their wild progenitor is unknown, we note that so-called variability has not been, in the cases studied, of self-origin, but rather of introduction from distant regions. Thus the tomato, for a century or more after its introduction, is always figured as of one type, that with red and flattened fruit, and in figures, from the old botanists, is as smooth and perfect in its form as many varieties under culture at the present day. The round, smooth cherry tomato seems to have remained unchanged from its first introduction. Our round, smooth tomatoes seem to have appeared suddenly, and the same may be said of types of our other now well-known varieties, and throughout their whole history there is no indication either of improvement in or change of the type. In the various cross-fertilizations between types which have come under notice, the general result has been no intermingling of types, observable, but variations even of quite wide degree which are readily referable to one or the other of the types, or even can be explained by atavism — the reappearance of some long lost progenitor. These remarks, be it understood, apply to vegetables, as I have not as yet sufficiently studied our florist's plants or pomological fruits.

The physiological relations of agricultural botany are equally interesting. Within the types already outlined, considerable variation may exist, and this variation seems very largely under the control of agencies set into action by mankind. We can obtain dwarf or gigantic plants; we can change the periods of maturity; we can obtain prolificacy or its opposite; we can secure size of fruit, increased or decreased weight of grain, etc. These changes can be made in a large degree hereditary in the strain. We can also secure new types through the action of atavism produced under the influence of cross-fertilization, preferably between widely differing forms. The extent of these changes within types seems not as yet well known. The evidence I have collected, however, seems sufficient to justify the statement that as our types probably originated in nature, we can not change these types through human selection, but as new types are desired must again have recourse to nature. This illustrates the desirability to the country of what are usually considered purely scientific establishments, *i. e.*, the

botanic gardens, wherein productions being brought from many different countries, new types can be secured.

Agricultural botany, both classificatory and physiological, I believe is a possibility. I believe, also, that a development of this branch of botany would be productive of great practical advantage to our gardens, and I believe, also, that it would be of great value to science in popularizing the study of botany and the extension of botanical research. It would make botany a more desirable study in our schools and colleges, not only by increasing the interest in it as a science but as well by broadening its scope to such a degree as to make it, while still retaining its scientific character, far more educational than it is at present. The study of botany, when applied to agriculture, would become a study into variations, their permanency and their causes. Instead of merely describing what of necessity brings into prominence the reasons for the essential or unessential points upon which description is or may be based, it would interest and expand that mental activity which adds pleasure to work and enthusiasm to progress. It would relieve the science of botany from the fetters of tradition and would tend to throw down the barriers which have been established by the despotism of systematists.

The Factors in Breeding Dairy Cows.

Read at the Ithaca Institute, February 18, 1887,
By E. A. POWELL,
Of Syracuse.

No important national agricultural industry is more susceptible to the influence of judicious management and intelligent enterprise than the production of milk, and yet no other industry, of equal importance to our whole country, has received so little scientific, intelligent study from those who depend upon it for a subsistence or follow it for a profession, or so little encouragement from the State or nation.

The cow is the most sensitive, complex and intricate piece of machinery in use in any branch of agricultural industry; sensitive to every change, every touch, ruined by neglect, improved by care, easily doubled in capacity by judicious management and enterprise on the part of the owner, and yet how few make any attempt at improvement. Four-fifths of the dairymen of the country are still using the old machine, which only produces 3,000 to 4,000 pounds of milk per year, while the best, from the same raw material, will produce fully double that amount. With intelligence in breeding, good care and good judgment in feeding, the yearly product of the dairy cows of the United States could be doubled in one decade.

There are four methods by which this *important machine* can be improved, viz.: By increasing the feed, by better care, by selection, and, above all, by breeding. All these methods are essential — all should be applied — but the last is indispensable in attaining the best results.

By higher feeding you merely increase the power that is applied to the same old structure; by special care you put it in working condition, but remove none of its natural defects; by care in selecting you secure the best of its kind, but by judicious breeding you can add all the improvements, all the new methods, can

make the best combinations, and by this last method only can you attain the highest degree of perfection.

You have in one family, the machine which will make the largest amount of milk; in another, that which will produce the most butter, and by combining the two you have, in the union, that which will give the largest return of both milk and butter. To this you can add all necessary attachments, can embellish and beautify the structure as taste and judgment dictate, adding beauty to utility, and thus, by the practical use of science, good judgment and common sense, build up the most profitable, useful and beautiful machine on the farm — the ideal dairy cow.

GOOD FEEDING ALONE INSUFFICIENT.

As an evidence of the uncertainty of depending upon high feeding for a large production, I will compare two cows in the Lakeside herd, of the same age, of about equal size, and each of which had been the winner of high honors. These cows commenced their records at about the same season of the year, were kept in the same stable, fed alike, were milked and cared for by the same men; one gave for the year over 12,000 pounds of milk, showing that she was a superior animal, but the other gave over 20,000 pounds, a difference of 8,000 pounds in one year. One machine, manufactured from the same material, at the same cost, 8,000 pounds more milk than the other. The quality of the milk of the two was proven by tests to be about equal. These were careful and accurate tests. I could mention a score of similar comparisons, showing equally astonishing results. You will thus see that you must have something more than feed and care, to obtain the largest product.

APPEARANCES UNCERTAIN.

Selections made from outward appearance are equally uncertain. At one of the leading fairs of our State two heifers were entered for the same prize; breeding was ignored and two expert judges were chosen to decide upon the merits of these two beautiful animals with others. Both were fine, and so similar in appearance that the casual observer would hardly distinguish one from the other. They were subjected to all the scrutiny which usually characterizes such inspections, the softness of coat, mellowness and color of skin, development of udder, size, length, direction and branches of mammary veins, the size and number of orifices at termination of

veins, the construction of the vertebra, length of tail, the class and order of escutcheon, the head, neck, horns, eyes, limbs, etc., etc., all received due and careful consideration — and what was the result? The one which her owners knew to be the poorest in breeding, and which they valued far below her mate, was pronounced *more milky*, and she left the ring clothed with honor. The other quietly joined the large circle of the vanquished. The following season both heifers were put to the only true test, that of actual performance, and the discarded heifer produced about double the amount of both milk and butter. A few years since one of the most noted expert judges of Holstein-Friesian cattle, visited the stables at Lakeside, and was asked to select the best butter cows. After a careful inspection he selected several which he pronounced the best. Accurate tests have since proven that he did not select any one of a dozen of the best butter cows in the herd, nor did he choose one out of the family that has excelled all others in the herd. I could mentioned any number of tests by experts which show similar results. Do not understand me to pronounce these judges incompetent. Not so. They were all honorable, experienced, competent, well-informed gentlemen, and did as well as any could do by the same method. I merely mention these facts to illustrate the uncertainty of any judge who does not depend upon the breeding or performance of the individual or her ancestors.

PEDIGREE THE SUREST TEST.

I will mention a few records which show the results of breeding, as proven by actual tests.

Two cows of the same breeding, quality and production on the side of the dam, but by different sires, one being used on account of his superior appearance, the other for his breeding, and, under like conditions, one cow gave about 10,500 pounds of milk in a year, while the other gave nearly 18,000 pounds. The former made about eleven pounds of butter in a week and the latter over twenty-two pounds. Two heifers, from the same dam, but by different sires, one of which was especially noted for the butter qualities of his get and his ancestors, were tested at about the same age, at the same season of the year, on a similar quality and amount of feed, when giving about the same amount of milk, and one actually made over 110 per cent more butter than the other.

The only Holstein-Friesian cow, in fact, I believe, the only cow

of any breed that has made 304 pounds five and one-half ounces of unsalted, well-worked butter in ninety days, was selected when an inferior looking calf, in bad condition, entirely on her breeding and reputation, qualities and superior production of her ancestors.

The only heifer, I believe, on record which has every made at twenty-eight months of age, twenty-one pounds ten and three-quarter ounces of unsalted butter in a week, was bred with the expectation of producing some such result. She was the produce of one of the best butter cows, from one of the most noted butter families of the breed, bred to her full-brother; by this close inbreeding the strong butter qualities of the family were intensified, and this phenomenal heifer was the result.

The three-year-old Holstein-Friesian heifer Albino 2d, which made last week twenty-five pounds five and one-half ounces of butter and gave last year as a two-year-old, 18,484 pounds thirteen ounces of milk in a year, sprang from a remarkable butter and milk family. Her dam made seventeen pounds thirteen ounces of butter in a week, in the hot and unfavorable weather of August, on grass, without grain of any kind, and had received none for several months. Her grand-dam made ninety-seven pounds five ounces of butter in thirty days, and gave 956½ pounds of milk in ten days. Albino, the dam of this heifer, was bought at a very high figure as a yearling, on her breeding.

Whole families show in an equally marked degree the effect of judicious breeding. You are all familiar with the remarkable butter records made by the whole families of Jerseys which have long been bred expressly for that purpose. Whole families of Holstein-Friesians are proving equally remarkable in this respect. An entire family of twenty cows of this breed show an average of eighteen pounds and one ounce of butter per week, eight of them being heifers from two to four years old. Thirteen of these, including all the mature cows, averaged over twenty pounds. Thirteen of these cows were tested by carefully keeping the weights of milk at the time, and it was found that the average for the whole was a pound of butter from 18.82 pounds of milk. Some of them made a pound of butter from thirteen, and fourteen pounds of milk. The value of these tests will be more fully appreciated when it is known that this whole family of mature cows which was tested for the year averaged 16,006 pounds of milk. Thirteen cows in one herd averaged over twenty-three pounds of butter per week; forty cows

in the same herd have made butter records which average over twenty pounds per week, and thirty (two years old) average over twelve pounds in a week. In another herd, five cows average over twenty-three pounds; twelve cows average over twenty-one pounds, and twenty-nine (nine two years old) average seventeen pounds. Had I the data at hand I could give similar records from other herds.

My purpose is not to recommend to you any particular breed. This important subject you must decide for yourselves, but, having decided, start with the best of its kind, or, having started, go up higher. The summit is still an unoccupied field.

In selecting stock which has not been proven by actual tests, be not deceived by a pedigree which is only a collection of unknown names, for pedigree without performance is valueless. A reliable perfect pedigree should be a continuous history of great performances by an unbroken line of illustrious ancestors.

Performance without pedigree is also of little value, as it furnishes no evidence of prepotency.

"The merits of a family should not be measured by the records of a single individual, but by the combined or average product of a majority or the whole."

SHORT TESTS MISLEADING.

Do not estimate the value of your cows by the result of a day, or a few days trial; such tests convey a very inaccurate idea of actual worth.

At Lakeside two cows commenced their years records at about the same time, were fed the same, milked and cared for by the same men; one gave a few pounds more for a single day — about the same for a month — nearly as much for six months, and yet at the close of the year the record of the cow which gave the least for a day exceeded the other by over 9,000 pounds, an amount which is equal to the yearly product of two of the average cows of our State; yet had these cows been judged by a short trial the poorer would have been declared the better. The actual value of a cow can only be known by a years trial.

You will observe that I have not made extreme comparisons, have not pitted the inferior or common cow against the best. Had I chosen extremes, I would have shown you that while many ordinary cows do not average 3,000 pounds of milk in a year, a

phenomenal one has given over 26,000 pounds in the same time, thus requiring over eight to equal one. While the average of the cows of the great Empire State, if my memory is correct, is only about 4,000 pounds per year, large herds, counting all the mature cows, have averaged over four times that amount.

I have confined my comparisons to No. 1 animals of the same breed and in the same herd, in order that all the conditions might be equal.

By continuing our investigations into other fields we would find that the influences of breeding are equally, or even more marked in other domestic animals.

You would find that a large share of the great trotting horses of America have descended from one great fountain-head. You would find that the successful breeders of horses estimate the value of their stock almost entirely by their pedigrees. You would find that, by breeding for a specific purpose, the dwarfed, diminutive Shetland pony can be transformed and built up into the mammoth and powerful Clydesdale.

So accurately can the thoroughbred horse be judged by his breeding that the most noted and skillful turfman in America, in his counting-room in New York, will pay his thousands for the undeveloped colt in Kentucky, with which to win the Derby. American dairymen and breeders of dairy stock underestimate the value of this important factor in developing and building up the great industry which they represent. In this respect we are far behind the breeders of many other domestic animals.

The domestic animal in the hands of the intelligent breeder is like the potter's clay in the hands of the skilled artist. It can be molded, shaped, changed and finished according to the will and skill of the artisan.

So marked are the influences of intelligent breeding that the will and wish of the understanding breeder of to-day will be stamped in legible characters upon the flocks and herds which will graze on the fields ten years hence.

Q. Will Mr. Powell tell us when is the best time of day to feed cows giving milk in the winter, morning and night, or all at noon, and let them be quiet till night?

Mr. POWELL.—The question does not seem to comprehend any methods of feeding, but as to the time. I can perhaps best answer by giving our own experience. We are in the habit of feeding our

cows several times a day. At 5 o'clock in the morning hay is fed, and grain at six, then silage and later straw. Next silage in the afternoon and toward night grain and last thing hay. Those methods have been employed very successfully, and with good results. It is important that a cow should have no more to eat at one time than she can digest thoroughly, and be ready for the next feed. The *kind* of feed will depend very much on what you want to get. If your object is butter you want a kind of feed that will produce rich milk. If your object is quantity of milk, you want another kind of food. If milk is the object feed wheat bran and ground oats largely. If you want butter you must feed something that has fat. You want linseed meal, cotton-seed meal, and corn meal. If you are using silage you can feed a small amount of cotton-seed meal. We feed with silage, two parts corn meal, two parts wheat bran, one part ground oats and a small portion of roots.

Q. By weight?

Mr. POWELL.—Yes, sir; for milk alone we feed even parts of bran and oats by weight, in bulk two parts bran and one part ground oats.

Q. Have you ever tested buckwheat?

Mr. POWELL.—We have to some extent. It undoubtedly will produce a large flow of milk, but of poor quality.

Mr. OWEN, of Chemung Co.—I want to speak of feeding cows for butter. We have been pursuing about the same plan as Mr. Powell for the last nine years. We mix two bushels of corn and one bushel of oats, and grind; and with this mix an equal amount of wheat bran, by measure, and we have found it to be the best feed for butter. We feed nothing but dry hay and corn stalks.

Q. Clover hay?

Mr. OWEN.—Feed any kind of hay.

Mr. WOODWARD.—The rations as given by both Messrs. Powell and Owen are very deficient in albuminoids, and remarkably so if the hay fed is not unmixed clover. Not half enough thought is given to the proper balancing of rations, and thus much food is wasted. If both these gentlemen would substitute cotton-seed meal for one-half the corn meal used, they would find it profitable. And especially should this be largely used where much corn silage is fed. When we know more of the chemistry of foods, as well as of the animal's wants, and employ this knowledge, in the proper com-

combination of foods, we shall find more profit in grain feeding and hear less of the unprofitableness of dairying or winter stock feeding.

Q. Will it pay me to warm water for my stock, if so in what way can it be done the best and cheapest? My cattle have to go about ten rods for their water, are out only long enough to get their water except in pleasant weather. The water runs into a tank that holds seventeen barrels, and so protected that ice forms over it only in the coldest weather. The temperature of the water varies from thirty-two to forty degrees.

Professor ROBERTS.—This winter we had one lot of three cows that we gave cold water, and they drank an average of 110 pounds per day. We then warmed the water and they drank 220 pounds per day, and when we had weighed and measured carefully we found that warming the water saved fourteen per cent in the feed of the animals. We didn't find any very great increase in the milk, but our cattle are in warm stables, in covered yards, so that they are not subject to any possibility of chilling. I judge that under less favorable circumstances, we should have found a very great difference in the yield of milk. We have a boiler and engine in our barn, and keep a fire all the time. In the morning we open the draft a little, and that makes the steam, and as the pipes go to the water boxes, we turn the stop cocks and the steam is sent into three or four large water boxes situated in different places. The best way for farmers who have no boilers in their barn is to have a tank situated in the upper part of the barn, that is higher than the water boxes; then take a common stove and run the stove-pipe through the tank. You can add another pipe that shall encircle the fire box, then you will have it warm so you can work in your shirt sleeves, and your men won't run to the house every few minutes to warm their feet or their hands. As Mr. Woodward has eliminated from his vocabulary "barnyard," I want to eliminate another phrase, "cold as a barn," and substitute, "*warm as a barn.*"

Q. If you have a running spring of water, running all the time, and isn't cold enough so it ever freezes over, would it pay to put in a stove, and go to the expense of warming the water?

Professor ROBERTS.—I should say it would, by all means. Heat the water to a temperature of about 80°.

Q. In reference to watering stock for milk, how often does Mr. Powell water his cows in their stalls?

Mr. POWELL.— We only water twice, but I think that is not the best thing. I will just say that during the largest record of two cows, we have made, they were watered every three hours, frequently every two hours, and the result was, I think, easily to be seen in the records.

Q. Does it affect the quality of the milk, or only the quantity?

Mr. POWELL.— Mostly the quantity. If you want to make the very richest milk possible, water very seldom; just enough to keep the animal in a healthy condition.

Professor LAW.— In getting more milk, I think you get more solids, also, in the milk.

Worth Considering.

Relative Growth of Evergreens.

In view of the very rapid consumption and destruction of our original timber forests and growths, it is important that we should give some thought to the planting of trees for timber or lumber production.

There are thousands of acres in our State that would pay better planted to trees than with any other use to which they can be devoted. Some are on steep or broken hillsides, too rough or stony for culture, and too poor to furnish profitable grazing; others have light soils, overlaying a porous subsoil, too thin and poor to pay the cost of culture, and not affording enough grass to compensate the cattle for the expenditure of muscle in wandering about to crop the scanty herbage. The rough and rocky hillsides are admirably adapted to the growth of ash, hickory, black walnut or other hard-wood trees suitable for the production of economic timber; while these light, sandy plains are just the place for the growth of some sort of resinous or evergreen trees.

In view of these facts, the following extract made from the Report of the Botanical Department of the Iowa Agricultural College, is worthy of careful consideration. They embrace over 600 measurements of ten species of evergreen trees growing upon the college grounds, and in each case the average is given: White Pine — 1886, 11 inches; 1885, 10.5 inches; 1884, 11.33 inches; 1883, 11 inches — average, 10.7 inches. Scotch Pine — 1886, 10 inches; 1885, 10.33 inches; 1884, 11 inches; 1883, 11 inches — average 10.6 inches. Red Pine — 1886, 8.6 inches; 1885, 12 inches; 1884, 10.5 inches; 1883, 10.3 inches — average, 10.3 inches. Austrian Pine — 1886, 8 inches; 1885, 8.2 inches; 1884, 10 inches; 1883, 11.3 inches — average, 9.4 inches. European Larch — 1886, 9.1 inches; 1885, 8.5 inches; 1884, 10 inches; 1883, 11.3 inches — average, 9.7 inches. American Larch — 1886, 7.2 inches; 1885, 11 inches; 1884, 8.5 inches; 1883, 10.5 inches — average, 9.3 inches. Norway Spruce — 1886, 8.5 inches; 1885, 7.5 inches; 1884, 9 inches; 1883, 9.8

inches — average, 8.7 inches. White Spruce — 1886, 9.6 inches; 1885, 7 inches; 1884, 7 inches; 1883, 8 inches — average, 7.4 inches. Black Spruce — 1886, 5.3 inches; 1885, 5 inches; 1884, 5.3 inches; 1883, 5.3 inches — average, 5.2 inches. Balsam Fir — 1886, 8.5 inches; 1885, 7.3 inches; 1884, 7.5 inches; 1883, 8.2 inches — average, 7.9 inches.

As near as possible these measurements were made on trees of the same age, and although the growths would be counted remarkably small for our State, no doubt the measurements show the comparative growth of the various trees and their value for timber. They show that the White Pine is the most vigorous grower of the lot, but is followed closely by the Scotch Pine, and this by the red pine. We have seen White Pines on the light sandy soils of our State maintain an average growth of at least forty or fifty per cent greater than did these, and the Scotch Pine do very nearly as well.

We know of a grove of White Pine which in our boyhood were not over four or five feet high. That now will average more than sixty feet and with an average diameter of at least fifteen inches, they are straight as "a candle" and are a beautiful sight and as healthy and vigorous now as they were fifty years ago. Surely the State or general government can do no better thing than to pass laws that shall result in the planting of thousands of acres of our poorer lands to timber trees and that without delay.

Proceedings of the Society.

ANNUAL MEETING, 1884.

Report of the Executive Committee.

The season of 1883 was less favorable for farming in New York than any of those recently preceding. It was late in opening, cold and wet through the summer months, and the frost that occurred on the fourth and fifth of September was not only very early but unusual in severity. In the western counties the autumn also was rainy and cold, but in the eastern part of the State there was such a drought, beginning with the month of September, as to shorten pastures, and, in some districts, to dry up wells and streams. The result has been a very poor crop of wheat, a large growth of oats and barley, with more straw than grain in proportion, a very large crop of potatoes, somewhat affected in all parts of the State, and in some counties quite seriously diminished by rot, and the poorest yield of corn for many years, so many that few of the members of the society can remember so near an approach to a failure. The bean and buckwheat crops, the one of much importance in the western and the other in the eastern part of the State, are also partial failures. There is a moderate-sized crop of hops, a comparatively small portion of which is of prime quality, and an average yield of tobacco in the southern tier of counties, of fair quality when not injured by the September frost. The product of cheese and butter has been fully up to the average, but in the northern counties the fall-made butter has not been of the usual quality. Cheese has sold very well during the year. Butter has not brought as high prices as usual, and has not been so profitable as cheese, although at the close of the season really fine qualities, being unusually scarce, have brought high prices. Pastures, however, have been good, and the live stock of the farm has thrived accordingly, and the hay crop is one of the largest ever grown in the State, though not of the usual average quality. Considering, also, the very low prices prevailing for wheat, barley and potatoes,

the year brings meager returns to many farmers, the dairymen having the best and the grain growers the worst, the fruit growers being also sufferers, through the failure of the apple crop, and the loss of the grapes by frost in the lake district.

One encouraging portion of the record of the season, however, is that better yields of clover seed are reported from several counties than, owing to the damage inflicted by the clover-seed midge and clover-root borer, have been obtained for several years.

Rather less wheat and rye have been sown this autumn than last year, but it is generally reported that both have made good growth and are unusually promising.

The health of farm animals has been maintained, and no occurrence of Texas fever or of anthrax has been reported, while the area in which pleuro-pneumonia exists is not known to have been extended.

The society held its forty-third annual show at Rochester, September tenth to fourteenth, at which there was brought out one of the largest and finest collections in all its departments, excepting that of flowers and fruits, that has ever been seen on such an occasion in this State. In the cattle classes the Jerseys were of the highest quality, and in number nearly equal to the great entry of last year, and the show of Holsteins was the largest and best yet made by the society. Shorthorns were good in number and in quality. There was as usual a large and beautiful display of Devons, but in Ayrshires, usually so full a class, there was a decided falling off. There was a very fine show of draught horses, and an unusually attractive display of carriage and road horses in the classes of breeding stock, but in that of harness and saddle horses the entry was a small one. The other classes of live stock were well filled. In the implement department the exhibition was unusually large and interesting, and in that of farm produce it was very satisfactory.

The attendance at the fair was larger than usual on the first two days, but Thursday was a stormy day and the number of visitors was comparatively small, though large considering the weather. The receipts at the gates were $13,249.16, as against $14,826.82 in 1877, $11,008.07 in 1874, and $19,799.77 in 1868, being the three last previous fairs held in Rochester.

Twenty-nine analyses of fertilizers have been made by Mr. Habirshaw, for the society, during the year, being twelve less than in

1882. The results, however, are of some interest, and go to confirm the views expressed by the committee in last year's report. Of the twenty-nine samples analyzed, one was a low grade kainit, and one, reported to have been sold as dissolved bone black, proved to be composed of Charleston rock, acidulated, with which was mixed an iron and alumina phosphate of unknown agricultural value, the proportions being 22.33 per cent of the former and 37.35 per cent of the latter. Taking the remaining twenty-seven, which have been valued this year, for reasons of convenience and especially for the sake of having results that can easily be compared with those obtained by the State chemist of Massachusetts and the chemists of the Connecticut and New Jersey experiment stations, according to the schedule of trade values adopted by those chemists, it is found that with the six superphosphates proper the valuation exceeds the cost in every case but one, and in that one the cost exceeds the valuation by only fifty-five cents. Taking all together the valuations amount to $226.61, and the cost to $211.50, the valuation exceeding the cost 7.14 per cent.

In the next class of what may be called simple manures, we have three samples of ground fish-scrap, three of sulphate of ammonia, three of muriate of potash, one of ground bone (a very fair article but sold at too high a price), one of Lobos guano, and one of nitrate of soda. Of these nine samples the aggregate cost was $685.50, and the aggregate valuation $759.12, the valuation exceeding the cost 10.74 per cent, although in the case of the ground bone and the Lobos guano, the cost considerably exceeded the value, thus reducing the average result.

In the class of compounded manures, consisting of ammoniated superphosphates and other mixtures, the result is, as last year, less satisfactory. Of the nine samples the aggregate cost is $374, and the aggregate valuation $312.77, the cost exceeding the valuation 19.57 per cent.

The schedule of values this year adopted is certainly a liberal one for the class of compounded manures as compared with simple ones, twenty-six cents per pound being assigned as the value of nitrogen in salts of ammonia, twenty-three cents in guano and ammoniated superphosphates, and twenty cents in nitrates, and four and one-half cents being allowed for potash in low grade sulphates and muriates, while the allowance for soluble phosphoric acid has been reduced to eleven, and for reverted to eight cents

per pound. In the three samples of sulphate of ammonia included in the second class of simple fertilizers above referred to, the average cost of nitrogen was 21.69 cents, and in the three samples of muriate of potash, the average cost of potash was 3.78 cents per pound.

The view expressed in last year's report is, therefore, confirmed, so far as so small a number of analyses can do it, and it may be further stated that Dr. Aitken, the chemist of the Highland and Agricultural Society of Scotland, in a valuable and important paper contained in the society's report for 1883, expresses the opinion that farmers "can effect a considerable saving by buying the materials they desire to have in their mixtures at the ordinary market prices, and mixing up the few tons they require at their own farms."

The executive committee record with profound and sincere regret, the loss sustained by the society and the State, in the death of George Geddes, ex-president of the society, which took place on the eighth of October. Mr. Geddes was born February 14, 1809, on the farm which his father had carved out of the wilderness, and on which he lived all his life. Connected with this society from its new beginning in 1841, he was one of its vice-presidents in 1848, and president in 1861. Few even of the earlier members have done so much to maintain its character and promote its usefulness. Ever ready with voice and pen, in counsel and in action, to advance the cause of agriculture, his teachings reached the public through many channels. His contributions to the Transactions of this society comprise a report of experiments with Indian corn, 1844; report of his farm, for which the society's premium had been awarded, 1845; a paper on the construction and advantages of plank-roads, 1846; the essay on rain, evaporation and filtration, for which the gold medal of the society was awarded, 1854; and the survey of the county of Onondaga, 1859. The services he rendered to the State, in numerous public employments and trusts, were also of the highest value. Of a singularly independent character, in which originality of thought was combined with patience in investigation, benevolence with firmness, decision with consideration for the opinions of others, he commanded the respect of all who knew him, and the strongest regard of those with whom he more intimately associated.

The committee record also, with sincere regret, the death of Mr. Henry E. Hooker, of Rochester, who established one of the oldest and most extensive of the nurseries in the neighborhood of that city, and was a frequent exhibitor of fruits at the shows of this society, as well as one of the founders of the Western New York Horticultural Society. A great loss has been sustained by the same societies, and by horticultural science, in the early death of Mr. Henry B. Ellwanger, of the same city.

TREASURER'S REPORT.

Receipts.

Balance from account of 1882, including value of medals	$5,458 01
Received from State Treasurer, on account 1882	5,280 65
Tickets sold at Rochester fair	13,249 16
Refreshment privileges	1,500 00
Catalogues	97 00
Transportation and forage account	254 00
Annual memberships	613 50
Life memberships	100 00
Cash from State Treasurer, on account 1883	4,706 25
	$31,258 57

Disbursements.

Expenses of annual meeting	$32 28
Premiums and expenses of previous years	318 65
Salaries and traveling expenses	4,495 96
Incidental expenses of office	76 55
Postage account	35 00
Library and museum	118 25
Printing and stationery	316 66
Maintenance of Elmira fair ground	452 38
Expenses of Rochester fair	11,693 83
Premiums and premium expenses	9,690 [illegible]
Medals on hand	150 [illegible]
Balance to new account	3,878 [illegible]
	$31,258 [illegible]

OFFICERS FOR 1884.

President.— William M. White, of Livingston.

Vice-Presidents.— First district, Cornelius R. Agnew, of New York; Second district, Isaac H. Cocks, of Queens; Third district, Jacob I. Van Hoesen, of Rensselaer; Fourth district, Alfred DeGraff, of Montgomery; Fifth district, James Geddes, of Onondaga; Sixth district, Joseph Juliand, of Chenango; Seventh district, W. A. Wadsworth, of Livingston; Eighth district, Marcus H. Phillips, of Orleans.

Corresponding Secretary.— Thomas L. Harison, of St. Lawrence.

Recording Secretary.— William H. Bogart, of Cayuga.

Treasurer.— Adin Thayer, of Rensselaer.

Executive Committee.— Davis Cossitt, of Onondaga; Gerrit S. Miller, of Madison; Charles C. B. Walker, of Steuben; Henry E. Alvord, of Orange; James McCann, of Chemung; T. R. Proctor, of Oneida; F. O. Chamberlain, of Ontario; Oscar J. Lewis, of Rensselaer.

Ex-Presidents.— Horatio Seymour, of Oneida; N. Martin Curtis, of St. Lawrence; Robert J. Swan, of Seneca; John D. Wing, of New York; George F. Mills, of Montgomery.

Mechanical and Consulting Engineer.— Henry Waterman.

Consulting Veterinarian.— James Law, F. R. C. V. S.

Chemist.— Wm. M. Habirshaw, F. C. S.

ADDRESS DELIVERED AT THE ANNUAL MEETING, JANUARY 16, 1884.

By GEORGE F. MILLS, President.

Gentlemen of the New York State Agricultural Society.— The time has arrived for me to vacate the position you so kindly placed me in one year ago. It gives me great pleasure, and I am sure it must be very gratifying to you all, to know that the last annual cattle show and fair of the society, held at the city of Rochester, was pronounced a success. The exhibition as a whole has never been surpassed in the history of the society. Among the gratifying features of the fair was its freedom from rowdyism and

dissipation, the exclusion of all inducements for the attendance of that element of society from which disorders arise. In the distribution of premiums care was exercised, and general satisfaction was given. A revision of the premium list is made every year, and it would greatly aid the managers if members and exhibitors would suggest such changes as seem to them desirable, in the departments to which their own attention has been especially directed.

The evening meetings were of unusual interest. The papers read on these occasions were instructive and merited larger audiences than were present. I would suggest that these lectures be given hereafter at some hour during the day, and in some hall, or tent, on the grounds, so as to give a larger number of farmers an opportunity of listening to and profiting by them.

The year just closed has been one of marked peculiarities. While the farmer, in the western part of our State, secured his crops with difficulty, owing to frequent rains, the crops in the eastern part were suffering for want of moisture. While acknowledging the elements to have been somewhat against us, grain crops were of a fair average yield, with the exception of wheat in the western part of the State. The early frost shortened the corn crop in most portions of the State, but it is claimed that the extra heavy oat crop will make up for the shortage of corn. The yield of potatoes was unprecedented, and it may not be amiss to mention here that the State of New York produces one-fifth of all the potatoes grown in the Union.

My attention has during the past year been somewhat directed to statistics, and I find from the report for 1882, made by the Department of Agriculture that, besides our great proportion of the potato crop, we raise one-third of all the buckwheat, one-fifth of the barley, and one-fifth of the hay that is grown in the Union. We lay no claim to importance in wheat and corn, but the same report states that our yield of wheat was 12,000,000 bushels; of corn 20,000,000, and of oats 40,000,000. With these apparently stupendous figures we need not feel alarmed lest we are over-producing, for we are assured of markets at home, as well as abroad, at prices that will compensate the farmer for his labor.

A few years ago many people were of opinion that the soil of the State of New York was becoming exhausted, but the reports made to the Agricultural Department show that our land is producing more every year. Improved methods and improved seeds, together

with a knowledge of the wants of our soil, bring about the desired results. We have learned also by experience that varied husbandry is, in our State, the secret of our uniform success.

The annual value of farm products of our own State is about $200,000,000. The annual report of the chief of the United States bureau of statistics shows that the total value of the exports for the fiscal year ending June 30, 1883, was larger than in any previous year of our history, having reached the imposing amount of one billion and a half, and being in excess of the imports for the same period by the sum of $117,326,909. The exportation of our products has begun within the memory of some who are with us to-night. I, for one, am proud to be able to speak of the marvelous rapidity of the advancement of American agriculture.

Looking at the facts just quoted, regarding our exports and the great productiveness of our country, the question arises — what is to become of it all? Some may ask: Is there not more food material than the world needs? By way of answer to these serious questions, I will read what a famous English statistician has recently written concerning the future of the human race. It is a dismal picture, but one not likely to be realized in our day. He says: "Population is increasing so rapidly that consumption will soon overtake production, and great suffering will result. In former times war, pestilence and famine put a check to the increase of population, and permitted the raising of sufficient food to supply those who survived these calamities. Twelve millions of the people of Great Britain are absolutely dependent upon food grown in other parts of the world; there would be starvation in Germany were it not for the large emigration. France alone has discovered the secret of limiting her population, but it is at the expense of the morals of large sections of the community. The troubles in Russia are due, in great part, to the taking up of all arable land in that country, for the population has increased prodigiously during the last half century. But in no country is there such a multiplication of human beings as in the United States. If we increase in the future as we have in the past we shall have a hundred million people early in the twentieth century, two hundred millions by 1925, and eight hundred millions by 1975. The country will then be more densely populated than China is, and the standard of comfort will be lowered as the price of land goes up, while the working classes will be subjected

to the most distressing privations. In India to-day the increase of inhabitants is so rapid that the government is appalled, and does not know what to do. It is trying to increase the amount of arable land by great irrigating works, yet the population increases at the rate of 1,000,000 per annum, and the multiplication of human beings is more rapid than the additions to food production."

I would like to say some words of encouragement to our young men brought up upon farms. There is a tendency now-a-days for farmers' sons to dislike the occupation of their fathers. It is a mistaken idea of theirs to leave the farm to go to a crowded city, with the expectation of making a fortune in an easier employment. Not one young man in 500 succeeds. It is not my province to tell others what they shall do, but I would say to those contemplating tilling the soil as their occupation, that while farming is laborious, requiring skill, experience and untiring energy and industry, yet all acknowledge that a farmer's life is an independent life. Science and the knowledge that comes from experience have helped to place agriculture in its present prosperous condition. Tilling the soil, like all other sciences, is capable of indefinite improvement, and those engaged in it should not be content with what has been gained at any former period, but should reach after new acquisitions, and devise and test new methods, instead of being satisfied always to follow in the ways of others. Defeat sometimes helps progress.

Young men should understand that success depends, in great measure, upon promptness and skill to seize opportunities, and take advantage of the rise of the tide. I would urge upon the man who is starting out in life with the intention of becoming a farmer, to thoroughly study the quality of the soil and what it is best adapted to, remembering that prices are always governed by the law of supply and demand. Locality is to be studied, for while a certain crop may be highly remunerative to the farmer in Queens county it will prove a loss to the farmer in St. Lawrence.

The subject of maintaining the fertility of the soil is brought prominently to the minds of farmers through the agricultural papers, and there is no doubt that the advertising, and making people acquainted with the facility of obtaining and using commercial fertilizers has been of service in suggesting the means of bringing up worn-out land. Where crops have largely increased you will find that farmers are using fertilizers extensively. We have reason also to believe that the analyses of commercial fertil-

izers by our chemist, Mr. Habirshaw, and by other chemists, and the publication of them in the various State and station reports, have done great good.

You will all agree with me that it was wise for our State to establish an experiment station. Those of you who examined the exhibition at the Rochester fair from the station farm must have been more than ever convinced of the benefits to be derived from that source. The first annual report of the board of control, made March 6, 1883, contains a full account of the operations of the first year. That report should be in the hands of every person in our State who is interested in farming. It speaks wonders also in praise of the management of the institution. The experiment station is, without doubt, a thoroughly practical feature of progressive agriculture, and its usefulness is proving its right to existence and support.

The breeding interest in the State has during the past year continued to develop, and New York not only maintains herself, but advances in this most useful and profitable agricultural pursuit. We have in our State an increasing number of intelligent men who have entered upon a systematic course in the breeding of horses. Some are making a specialty of the carriage and road horse, others of the heavy animals for agricultural and draught purposes. All who witnessed the fine display of the several breeds at our late fair must be convinced that they are making a great success in this department. The improvement of stock is a subject of vast importance to the farmer, and he should well inform himself, so as to select the breed best adapted to his locality and purpose. Within the limits of our State we have herds of thoroughbred neat stock of undoubted purity of blood and great excellence of quality, and their skillful and careful breeding has attracted the attention of admirers of thoroughbred cattle throughout the country. The many fine specimens on exhibition at Rochester were conclusive evidence that the State of New York may again become the acknowledged leader in the rearing of improved breeds of cattle.

The wonderfully fine display of agricultural implements at the late fair has never been equaled. The mechanics of our State have good reason to be proud of their inventive genius and skillful use of material. As I looked over the acres of useful machines I was more than ever impressed with the thought that art and science help no pursuit more than that of the farmer.

Since our last gathering here a valued friend has been removed by the hand of death. No one had the interest of the society more truly at heart than the late Mr. George Geddes, and no one had done more for its advancement and success. His memory will be gratefully cherished by all its members.

To the gentlemen of the executive board, the general manager and general superintendent, I desire to express my sincere thanks for their kind support, and especially do I desire to return thanks to our worthy and efficient secretary, who has at all times been ready to make my duties easy and pleasant.

My last official duty that remains to be performed is a very agreeable one — I have the pleasure of introducing to you, as my successor, one who is well known to be a true friend of the society, one in every way qualified to direct it successfully — Mr. William M. White, of Livingston.

ANNUAL MEETING, 1885.

REPORT OF THE EXECUTIVE COMMITTEE.

The season of 1884 has been one of full average productiveness for the State of New York, although in various degrees in different districts. Excellent crops of wheat and other kinds of grain, of hay and of potatoes have been obtained in the western counties, and in the western counties of the southern tier, the only exceptions being as to hay and grain in general, in Wyoming, and, as to corn and hay, in Cayuga. In the central and southern-central counties, and in the Hudson river valley, including Long Island, the reports are less uniform, drought having quite generally injured the hay crop and, to some extent, the spring-sown grains; but, upon the whole, the results of the harvest in these counties were but slightly below the average, the effect of the drought being most felt in Columbia and in Suffolk. In the northern counties the crops generally, and, except during part of August, the pastures have been good, and the yield of dairies has been satisfactory. The crop of tobacco, in the few counties in which this plant is cultivated, has been a good one, and there has been a fair, though not a full, crop of hops, of variable quality, first-rate samples being the exception.

The severe frost of the last days of May, from the twenty-eighth to the thirty-first, varying in date in different parts of the State, but occurring everywhere, ruined the crop of apples, only a few orchards escaping, in several counties in the eastern part of the State, and probably also affected the hay crop, but in the western and northern counties it did comparatively very little harm.

The prices of dairy products, though not so good as last year, have been remunerative, and the same may be said as regards live stock of all kinds. As to all other products the decline in prices, begun two years ago, has continued, until it seems impossible that it should go further, so that, while there is abundance, there is no longer prosperity, and the times enforce, as strongly as ever before, upon the farmers of the State, the necessity of economy in expenditure and of diligence in husbanding all resources for increase of income.

About the same area as usual has been sown with wheat and rye this autumn, and the condition of the plant at the close of the season was very satisfactory.

The live stock of the farm has been more than usually free from disease during the past year. It would not, however, be wise for us to relax, on account of temporary immunity, our efforts to obtain by State and Federal legislation, the protection of which we stand in need. The act of Congress, passed early in the year, establishing in the Department of Agriculture a bureau of animal industry, can be of little use until the money to pay for animals slaughtered to prevent the spread of infection, and for the expenses of quarantine and disinfection, shall be provided. It is hoped that the occurrence during the past year of pleuro-pneumonia, in Ohio and other States previously uninfected, may awaken the farmers and breeders of the Western States to the perception of their danger. The executive committee was efficiently represented at Washington in May, and at the cattle convention held at St. Louis in November, by ex-President Curtis, for the purpose of presenting and advocating the views of the committee upon the subject of the protection of domestic animals from contagious diseases.

The forty-fourth annual cattle show and fair of the society, held at Elmira, the fourth to the tenth of September, was in every way, as an exhibition, creditable and successful. Especially are to be noted the increased number of Holstein and of Guernsey cattle, the fine display in the class of roadsters, and the large and

admirable collection of fine-wooled sheep. But while these were prominent features, the live stock show was very complete in all its departments, the weakest point being in the poultry which was probably due to the character of the season.

The exhibition of implements was one of the largest and best ever made at our fairs, especially in steam engines for farm purposes and in harvesting machinery.

The show of farm produce was moderate in quantity but good in quality. That of fruits and flowers, owing partly to the early date of the fair and partly to the extreme heat, was neither as large nor as attractive as on some previous occasions.

The receipts for admission to the show were larger than usual, the weather being fine throughout, the public interest being, as shown by the attendance, very widely extended, and the number of the days of exhibition having been increased by opening the fair on Thursday and continuing it until the Wednesday of the following week. The sales of tickets amounted to $15,824, as against $13,543 in 1881, $12,023 in 1878, and $14,108 in 1875, the three last previous years in which the fair was held at Elmira. The expenses of the fair were also largely increased, not to any great extent by the increase of the length of time during which the show continued, but chiefly by the expenditure required for the repair of the buildings which, having stood for twelve years without needing any very large outlay, at length began to be seriously dilapidated.

The executive committee have also expended about $2,300 in new buildings, one-half in the construction of forty-eight additional horse stalls, which the growth of that department rendered necessary, and the other half for a cottage for the keeper of the grounds, the want of which had always occasioned inconvenience.

Forty-two analyses of fertilizers have been made for the society, during the year, by Mr. William M. Habirshaw, F. C. S. chemist to the society. Of these, three were samples of unleached wood ashes giving, on the average, 3.63 per cent of potash, in the forms of carbonate and phosphate, and 1.06 per cent of insoluble phosphoric acid. It is difficult to determine the cost of potash in ashes, leached or unleached, but assuming the weight of a bushel of ashes to be fifty-six pounds, and taking the best of the three samples which gave .91 per cent of phosphoric acid and 4.11 per cent of potash, and cost thirty-four cents per bushel (which seems to have

been for some time the prevailing price), and allowing the high price of four cents per pound for the phosphoric acid, the potash in this sample cost thirteen and seven-eighths cents per pound, a price which renders the application of potash in this form an absurdity unless there is some practical benefit derived for which no scientific explanation has yet been found.

In the four samples of muriate of potash analyzed this year, the average cost of potash is found to be 3.83 cents per pound and in the three samples of potash salts it was 4.96 cents.

In two samples of sulphate of ammonia the cost of nitrogen was nineteen and eight-tenths and eighteen and seven-tenths cents per pound respectively, the higher priced sample being the cheaper as a supply of nitrogen.

In one sample of dried and ground fish scrap, the cost of nitrogen, allowing the schedule price for the phosphoric acid which it contained, was fourteen cents per pound.

In one sample of tankage, allowing for the phosphoric acid as in the sample last mentioned, the cost of nitrogen was nearly twenty-eight cents per pound.

One sample of Lobos guano and one of Cooper's No. 2 bonedust call for no special remark, except that in the latter, after making the schedule allowance for nitrogen, the cost of its phosphoric acid was considerably less than the computed value.

A sample of a fertilizer, sold under the name of rotted bone, for fourteen dollars per ton, contained by analysis 1.77 per cent of nitrogen, worth, according to the schedule, six dollars and thirty-seven cents. It contained a total of 1.24 per cent of phosphoric acid, which cost, by difference, over thirty cents per pound. A sample sent in under the same name, of the same cost price, and as manufactured by the same person, was analyzed for the society in 1882, and showed 2.56 per cent of nitrogen and 1.15 per cent of phosphoric acid. That such an article should continue to be made and sold at the price shows the need of the information which this society and the experiment stations of our own and other States are endeavoring to supply.

The remaining twenty-five samples divide themselves, as has been the case in previous years, quite distinctly into two classes. Ten of them are plain superphosphates, made from bones or other phosphatic material, and sold as such at various prices, ranging from twenty-two dollars to as high, in one case, as sixty-five dollars per ton.

That they are properly designated as plain superphosphates is shown by the fact that in five of them only was any appreciable amount of nitrogen discoverable, averaging less than thirty-one one-hundreths of one per cent, and that none contained potash. In the case of three of these samples the cost exceeds the valuation, on the average, by three dollars and ninety-seven cents per ton. Of the remaining seven samples, including the highest-priced one, the valuation exceeds the cost, on the average, by three dollars and forty-five cents per ton. The aggregate cost of the ten was $299.30, the aggregate valuation is $311.56, showing an excess of valuation over cost of something more than four per cent.

The other fifteen samples are all ammoniated superphosphates, and compounded or special fertilizers, in the greater number of which potash as well as some nitrogenous material has been added, for the purpose of making a more complete fertilizer, and sometimes with the intention of making a compound specially adapted to the requirements of a particular crop. That such additions are useful is not denied, but in the case of the fifteen samples now under consideration there is but one of which the valuation exceeds the cost, and that by only sixty-five cents per ton. The aggregate cost of the fifteen samples was $593.50, the aggregate valuation is $457.88, the cost exceeding the valuation, on the average, by nine dollars and three cents per ton, or about twenty-nine and one-half per cent.

An examination of the details of the analyses referred to will, of course, show that the differences between cost and valuation have a very wide range, but the fact remains that for the fifteen samples last herein considered the purchasers have paid, on the average, nine dollars a ton for combining fertilizing materials which it would have cost them very much less to mix for themselves.

The executive committee record, with profound regret, the death of Mr. Solon D. Hungerford, ex-president of the society, which took place on the twelfth of May last. Mr. Hungerford was seventy-six years of age. He was one of the earliest, and, for a long time, one of the most prominent breeders of Ayrshire cattle in the State, and devoted, also, much attention to horses and other stock. He was first elected a vice-president of the society in 1861, and was president in 1870.

The death of Mr. Jonathan Thorne, on the ninth of October last, at the age of eighty-four, removes from the list of living members

of the society a name which will long be kindly remembered and always honored. Although actively connected for only a few years with the work of the society, to his share in which his sons early succeeded, Mr. Thorne always retained his interest in its affairs, and to him the nation owes the acquisition of many of the choicest Shorthorns ever imported from Great Britain. Beginning with the sale of Earl Ducie's herd, in 1852, at which he purchased three of the Duchesses, his importations continued for several years, until the Thorndale herd became the center of the short-horn interest in America.

Mr. Burton G. Morss, of Greene county, died on the thirteenth of September, at the age of seventy-four. He was one of the largest and most successful of the dairy farmers of the State, and among the first to appreciate the value of the Jersey breed as a cross upon our common stock, having for many years a herd of about 200 cows, of which all that were not thoroughbred were Jersey grades.

It is fitting also to mention with honor the names of two distinguished foreigners, who, having rendered most important service to the cause of agriculture, have during the past year ceased from their labors.

Mr. Jean Augustin Barral, the eminent French chemist and agricultural writer, died on the twelfth of September, at the age of sixty-six. He was best known to us as for many years the editor of the journal published by the National Agricultural Society of France, and our society had the honor of enrolling his name upon its list of corresponding and honorary members.

The death of Dr. Augustus Voelcker, on the fifth of December, at the age of sixty-two, is a calamity which will be felt and deplored in our country as well as in that of his adoption. His work as chemist to the Royal Agricultural Society of England has been of the highest value, and the benefit of his investigations has been largely shared by the farmers, and especially by the dairy farmers, of the United States.

MEMORIAL OF CHARLES DOWNING.

By PATRICK BARRY, Rochester, N. Y.

Charles Downing, the distinguished pomologist and horticulturist, died at his residence in Newburgh on the eighteenth of January, instant, in the eighty-second year of his age, and this closes a long and useful career. In early life Mr. Downing was actively engaged in the nursery business, in which he was distinguished alike for his skill as a practical cultivator, and for his accuracy and trustworthiness in all matters pertaining to the varieties of fruits, ornamental trees and plants which he cultivated and sold.

Whatever Charles Downing sent out from his nursery was regarded as almost absolutely correct. A more careful, intelligent, conscientious man than he has never been known in that business. Some thirty years ago, shortly after the death of his greatly lamented brother, A. J. Downing, author of the "Fruits and Fruit Trees of America," and of several works on landscape gardening and rural architecture, Charles retired from the nursery business, and from that time until his death devoted himself to the study of pomology and to the correction and revision from time to time of his brother's great work, the "Fruits and Fruit Trees of America." This book has been and is to-day regarded as the standard authority on American fruits throughout the world, and Charles Downing was everywhere acknowledged to be one of the foremost pomologists of his day.

He was a remarkably modest and retiring man by nature, and, although a regular attendant at pomological and horticultural meetings, was seldom heard to speak except when called upon for his opinion, which he would give with absolute frankness and honesty, but in the fewest possible words. He was not hasty in forming an opinion, but when once formed he adhered to it steadfastly. The name of Charles Downing was familiar as a household word in every American home where an intelligent interest is taken in rural affairs, and the news of his death will be received with sorrow. All will say that a good man has departed. Who will take his place? is a question that will be asked — who will

keep up the standard character of the "Fruits and Fruit Trees of America" by constant additions and revisions as he did?

It is a national work, and it is to be hoped for the sake of the memory of the brothers Downing, as well as for the interest of American pomology, that the work will pass into careful, loving and able hands, who will perpetuate it through coming generations.

TREASURER'S REPORT.

Receipts.

Cash from 1883	$3,878 42
Medals on hand	150 31
From State on account, 1883	5,000 00
Tickets sold at Elmira fair	15,824 12
Refreshment privileges	1,479 00
Catalogues sold	101 50
Transportation	370 60
Annual memberships	765 00
Life memberships	180 00
Cash from State Treasurer on account, 1884	1,706 25
Sundries	175 00
	$29,630 20

Disbursements.

Expenses of annual meeting	$29 40
Expenses of previous years	1,515 39
Salaries and traveling expenses	4,128 53
Incidental expenses of office	274 92
Postage account	40 84
Library and museum	163 57
Printing and stationery	8 75
Maintenance of Elmira fair grounds	2,646 15
Expenses of Elmira fair	11,464 93
Premiums and premium expenses	9,124 47
Medals on hand	90 31
Balance to new account	142 94
	$29,630 20

OFFICERS FOR 1885.

President.—James W. Wadsworth, of Livingston county.

Vice-Presidents.—First district, Cornelius R. Agnew, of New York; Second district, Isaac H. Cocks, of Queens; Third district, Jacob I. Van Hoesen, of Rensselaer; Fourth district, Giles H. F. Van Horne, of Montgomery; Fifth district, James Geddes, of Onondaga; Sixth district, Joseph Juliand, of Chenango; Seventh district, W. A. Wadsworth, of Livingston; Eighth district, Marcus H. Phillips, of Orleans.

Corresponding Secretary.—Thomas L. Harison, of St. Lawrence.

Recording Secretary.—William H. Bogart, of Cayuga.

Treasurer.—Adin Thayer, of Rensselaer.

Executive Committee.—Davis Cossitt, of Onondaga; Gerrit S. Miller, of Madison; Charles C. B. Walker, of Steuben; Henry E. Alvord, of Orange; James McCann, of Chemung; Thomas R. Proctor, of Oneida; Frank O. Chamberlain, of Ontario; Oscar J. Lewis, of Rensselaer.

Ex-Presidents.—N. Martin Curtis, of St. Lawrence; Robert J. Swan, of Seneca; John D. Wing, of New York; George F. Mills, of Montgomery; William M. White, of Livingston.

Consulting Veterinarian.—James Law, F. R. C. V. S.

Chemist.—Wm. M. Habirshaw, F. C. S.

ADDRESS DELIVERED AT THE ANNUAL MEETING, JANUARY 21, 1885.

By WILLIAM M. WHITE, President.

Gentlemen of the New York State Agricultural Society.—In February, 1832, a company of gentlemen issued a call for the formation of a State agricultural society. The circular stated the objects of the proposed society as follows:

1. For the purpose of improving our husbandry, horticulture and the household arts.

2. In stock husbandry, in relation to the breeding, management, habits, diseases and means of prevention and cure and choice of breeds.

3. In tillage husbandry, in relation to the cultivation of grains, grapes, vegetables and roots, manures and their application, rotation of crops, improvements of implements, draining, fences (including hedges), the orchard and the manufacture of cider.

4. In horticulture, in reference to the culture of fruit, ornamental trees, shrubs, plants and methods of propagating them, the diseases to which they are incident, and the methods of prevention and cure, culinary vegetables and the flower garden.

5. In the household arts, embracing household fabrics, raising of silk-worms, manufacture of butter and cheese, of domestic wines, the preservation of fruits, and the various preparations of household economy.

And it adds, commending itself to the reader, "By collecting the practical knowledge of our best farmers and gardeners in their respective branches of labor, a very valuable fund of information will be obtained, which, while it impoverishes not the contributor, can not fail to enrich very greatly the community at large. Such contributions, like the offerings of charity, are blessed to the giver as well as to the receiver."

This was the work laid out for the New York State Agricultural Society. What has she accomplished?

The report of your executive committee gives a synopsis of the agricultural results of the past year as well as the success attending the holding of the forty-fourth annual cattle show and fair at Elmira, in September. We are to be congratulated on both, and can look back with thanksgiving on the year that has closed, as one of general prosperity and great fruitfulness, giving a plethora of production, and over-abundance of all the necessaries of life.

Any one visiting the exhibition would have concluded that the people making such an exposition were intelligent, industrious and rich. He would have found a full and explicit answer as to what has been accomplished, in and through the State Agricultural Society, of the ends and purposes of its founders; in stock-husbandry, the best horses in the world, adapted to the different uses, all the approved breeds of cattle for the dairy, for the production of beef, and for the combined purposes, the family cow, were there in perfection; the sheep that America has developed, and the many breeds that England has created; swine suited for the sty and those adapted to the cornfields of the west; poultry bred to a feather and hatched to order by the thousand; all showed

what an influence had been at work directing the intelligence of the people in the great science of breeding. The farmers of New York have compassed sea and land and possessed themselves of the best of all nations, and are earnestly occupied in further improvement. The only doubt in their minds is whether there is a point beyond which development is destruction. In tillage husbandry, machinery doing the work of man, implements that lighten the labor, yet triple the daily task and perfect the accomplished work, only requiring intelligent direction to reward man four-fold for the knowledge and skill he has made his own. In horticulture, from the strawberry to the grape, including the plum, the pear and the apple, the imagination fails to devise an additional flavor or a lacking taste that development has forgotten; while, in arboriculture, our Princes and our Barrys have made possible a restored Eden; our Thorburns and our Vicks have filled our gardens with endless varieties of culinary vegetables so enlarged and improved, and developed to such a degree, that the original parent would not recognize its latest grandchild; and in the realms of Flora, our homes are surrounded with miracles of beauty, filling the air with the odors of flower-given incense and perfume.

In the household arts, mills and machinery have taken the place of the cards, the spinning-wheel and the loom. They have been replaced by the cooking-stove, the washing-machine and the sewing-machine, making labor less irksome, and home-life pleasanter. The factory has absorbed the dairy manufacture of butter and cheese. The air-tight jar preserves the berries and fruits of summer easily and perfectly. The manufacture of domestic wines has given way to the preaching of total abstinence, and the art has ceased as a domestic economy, but is now a specialty, as in older countries, in favored homes of the grape, where vineyards and wine-cellars are cared for by the unconverted, and the cider of old can be found only in intensely rural districts where the purity of innocence permits its manufacture.

One point more: As to insects and diseases injurious to vegetation, the researches of the society have been thorough, earnest and continuous. So many enemies have been discovered that the average man, having read of them all, and partially comprehended their powers, becomes demoralized in the belief that human ability, assisted only by the better side of nature, can not possibly produce

a crop. But (pleasantry aside) the researches of Dr. Fitch and Professor Lintner have been, and will continue to be, of great value to this commonwealth, for certain facts and habits of insects and diseases become "current knowledge," and men act on that knowledge, and avoid mistakes and losses, indirectly saving to the State ten times the cost of the original outlay.

Reviewing the field, the agriculturist of fifty years ago, revisiting the scene of his own labors, would declare that the society he helped to form, and the influence he then exerted, had borne fruit a thousand-fold, and (to his conceptions) had perfected their labors. All this has come from the persistent efforts of the American people to better their condition, and they have; they have opened the doors to emigration, and shut out foreign competition in their own markets. They have increased home consumption, and provided the raw material; they have created employment and made a market for their food. They have increased their productive power until a prosperous year has glutted the markets of the world.

The tariff of 1842 was protective, the tariff of 1848 was "for revenue only." In 1852 I embarked in farming and employed men. Labor commanded from ten dollars to thirteen dollars a month and board, and work "from sun to sun." In 1882, I paid just double the amount for the same labor, and only ten hours a day. Under the tariff of 1864, capital divides with labor and labor has the lion's share. Taking as a basis of values the prices of 1860, just before the war, in gold, and comparing them with the current values of the day, the purchase power of money has largely increased. The shrinkage in value is over twenty per cent. What now cost $100 would have cost $125 in 1860. Clothing is twenty-five per cent cheaper; bread-stuffs are thirty per cent, sugar, tea and coffee twenty-five per cent less; metals, coal and oil over forty per cent less, and manufactured articles, glass, paint and chemicals nearly thirty per cent less. So there are some compensations for the wonderful accumulation of wealth that has been made during the last twenty years, and the average man gets his benefit in the improved power and ability of the nation to provide and produce the necessaries of life; we live better, we consume more, and we produce (earn) more than we did twenty-five years ago, *and that is prosperity.*

The development of the farmer has not been confined to the farm and the stock, the same impulse has created the desire that

his children should be improved in manhood and womanhood and intelligence. To this end the public school system has been developed, and your society has had its influence. An education is now the heritage of every child born to the State. It is within his reach; it is his, if he will. Our public schools are superior to the private ones. They are more thorough, more independent, more systematic and satisfactory. They take the student from the primary through the university by a regular system of advancement, and at a cost to the pupil only of the books needed on the way. The road to knowledge is open to all, and so perfectly has the system been developed and administered, that if you would give your son the best opportunities, if you would give him an equal chance in the race of life, you must avail yourself of the privileges offered by the State to all her children, or take the risk of dwarfing him by the coddling, coaching process of intense gentility and seclusion.

I was present as your representative at a meeting of the trustees of Cornell University, to apportion and appropriate over $200,000 of income, for salaries and expenses for the year in instructing 600 pupils in that institution. The annual charges are seventy-five dollars a year, but every Assembly district in the State is entitled to the free tuition of one pupil duly qualified. This institution was founded in the name of agriculture, and is a child of the New York State Agricultural Society. Here also the fact is recognized that a developed mind needs a developed body to make it valuable, and the physical condition of every student is examined and recorded; then such exercise and training is given as to perfect the body, and develop its latent powers, and harmonize the relations of the physical and the mental; they go further, they educate the hands, the fingers and the eye; they combine the science, the art, with the practical skill of the craftsman. They combine theory and practice, and turn out, as the result, the useful man, ready for the realities of the world.

Fifty years have made changes in our surroundings. Proximity to a market *had* much to do with the value of our land and the purposes for which it could be used; distance *had* a controlling power; the frosts of winter blocked all water communication, navigation closed, and in harmony with nature the business world rested from its labor. But change came; the magnitudes of our country offered a premium to him who would overcome them. The railroad became the new factor in the development of the country. Its influence

is peculiar and all-prevading, and yet it is so new, so novel and so complex that we do not see nor comprehend the new relations it places upon us. Albany was the head of navigation, and a distributing point, an *entrepôt* of commerce. To-day it is a way-station on the railroad and the canal. Buffalo was *the* port of Lake Erie, and commanded the commerce of the North-west. To-day it is the end of a division on trans-continental lines of rail; a yard for the switching of freight cars. Distance was a measure of space; now Chicago is nearer New York, in price and cost, than many way-stations in our State. Geography is forestalled, and the actual differs from the real. The fields of Nebraska and Dakota give us wheat, and the feeding-grounds of the buffalo are our pastures.

This surely is broad-acre farming and has little to do with our conception of our calling and occupation, but it controls prices and governs values. We must be governed by the conditions which surround us. Railroads found us a province by ourselves, and have made us a subdivision of the great field of American production. The Erie canal was begun in 1817, and completed in 1825; it opened a market to the pioneers who had pushed on in advance, and gave a money value to grain and to land. Prior to this the available agricultural region was confined to the valleys of the Hudson and the Mohawk. At that time farms in Whitestown (Oneida county) were worth $100 an acre; the canal reduced the value nearly one-half. The area of production had been increased, and the market to be supplied remained the same as it was before; the canal had reduced the cost of transportation and lessened the value of grain, while increasing the supply. In 1817, it cost $100 a ton to carry freight from Albany to Buffalo; to-day freights are carried from Chicago to New York for half a cent per ton per mile at a profit, a thousand miles for five dollars a ton. Winter wheat is worth seventy cents a bushel in western New York, and the best flour brings only five dollar a barrel in New York city; dressed beef is sold for eight cents a pound by the car-load in our cities; food is plenty and cheap, and labor is begging for employment.

Next to the exhausting effects of famine, penury and want, in the business world comes the demoralizing influence of too great prosperity, producing and manufacturing more than the community can consume or use. The surplus is an incubus on all effort and enterprise; stagnation and starvation join hands in a weary waiting for a healthy demand of the powers of production. What is wanted

is a market where we can dispose of what we can raise and what we can produce and manufacture, so that labor may be employed and occupation provided; give us the markets and America is equal to feeding and clothing the civilized world. This necessity, this providing a market for the productive power of a people, is the question of the day in statesmanship, and is the factor that is opening Asia and Africa to the commerce of the world. England is no better off than ourselves, save for the accumulated wealth of the past. She is one gigantic work-shop, and depends on the increased value of her manufactured article, for the power to feed and clothe her people. She has capital, coal, machinery, brain-power, experience and labor, but she depends on other countries for food and raw material to manufacture. Business depression exists there as well here, but food is cheap; wheat is lower than it has been in recorded history, and on November 22, 1884, commanded ninety-three and one-quarter cents a bushel in Liverpool, fifteen cents a bushel cheaper than ever before known. England's farming interests are on the wane; the value of her agricultural lands has decreased from one-half to two-thirds in the last decade under the influence of her free-trade policy, and the repeal of her "corn laws." The home market is destroyed by the cheapness and facility with which America can supply her with grain, beef and cheese. The plethora of excessive manufacture shuts up her mills or reduces her people in the earning power to the absolute necessities of life, with a large percentage of her population the object of public care and charity.

In round numbers, the population of the United States is 58,000,000; of these one-third (18,500,000) are a working army busy in the occupations of life outside the family. Four millions are engaged in manufacturing, mechanical and mining industries; 2,000,000 are devoted to trade and transportation (internal commerce); 4,000,000 are classed in the learned professions, law, literature and teaching, the press, civil engineering, physics and divinity, and 8,000,000 are farmers or farm laborers. Less than one-half are occupied on the land, in the production of food and in raising the raw material of manufacture — cotton, wool, hemp, flax, silk. Our nation has passed beyond the first era of a new country, where all are producers. A majority of the body politic are now consumers. Another fact is that only one-third of our people are the bread-winners and the care-takers, at one time, as

generation follows generation in the sequence of life. These changes have come, and yet the great problem that was unsolved by our fathers still stares us in the face — How best to cultivate our farms; how best to care for our stock; what crops to raise. How best to economize, is the question of the hour.

True economy is a wise expenditure of means to accomplish ends; "doing without" is a forced meaning of the word, and accomplishes nothing, but begets sloth and idleness. We must bend our energies to the solving of the problem. One reason why it is still unsolved is that our relations as farmers and producers have entirely changed. America has grown larger in the last fifty years, and Uncle Sam's farm has taken the place that our farm used to occupy. Our horizon has enlarged, we have grown cosmopolitan, we now regard the world as our market, and our values are now measured by the needs of humanity, not by the wants of our country and our State.

It is but 100 years ago since the first exodus was made from New England into the wilds of western New York; when all west of Utica was a wilderness, the home of the Indian, and his hunting ground. The van of the pioneer, the only means of conveyance, pushed its way to the rich country of the Genesee, and beyond into Ohio and the west. The settlements were self-sustaining; food and raiment could be had, but isolation and existence were all that the wilderness offered the settler, save and except the hope of increased value in the land, and increased comfort in living as he advanced in life, and the probability that he might provide for his children better opportunities and surroundings in the fertile west than on the second and third-rate lands of inclement New England. In that day the only way of getting a living was to get it out of the soil; what was raised was consumed at home; nothing could be sold, and nothing could be bought; each family was independent and self-supporting; the wheat, the meat, the sugar and the clothing were all the products of the farm and the family; production and manufacture had not been separated, and the man was "jack of all trades and master of none."

Can you picture the scene: a wilderness, a clearing, a log cabin, a man, his wife and young children, a cow or two, a yoke of oxen, and an ax, an augur and saw; and the task the making of a farm and a home, and providing for the daily wants? The nearest neighbor a mile away; solitude with faith and courage, manhood

and health, the only surroundings. Do you wonder that it bred a race of independent men and women, self-reliant, strong, energetic? This was the training that has developed Americans and America.

To-day there are 250,000 farms in this State, covering 24,000,000 of acres; 18,000,000 improved, 6,000,000 in wood and timber. The average farm is ninety-six acres, and of improved land seventy-two acres. There are 70,000 more farmers in this State than there were in 1850. Then the average farm was 139 acres. A man with a team, without improved implements, is equal to the cultivation, manipulation, of fifty acres of land. A little help in harvesting completes the labors. But with the cares of the farm, he rarely works over forty acres, leaving thirty-two acres of cleared land for pasture and meadow, which is the practical working of the agricultural problem as we find it in the farms of the State.

In the rural districts, given a house and furniture, a man and a woman (man and wife) can buy both food and fuel with $100 a year, and live comfortably. Add fifty dollars to that sum, and they are clothed respectably. The cost of caring for our poor in some of our counties will bear me out in these figures. On this basis no grinding poverty can exist, with health, in our commonwealth of agriculture, except it comes from sloth, indolence and ignorance. Farming was never intended for the rich men; they can not make it profitable, nor are they willing to live the farmer's life. The perquisites of the farm are what give it its real value, and place it first among the labors of men. It enables the poor man, so to speak, to have a home, to live comfortably and happily, and to raise a family of children, to be independent of other men, his own master; providing better against depressions, disasters, losses and the misfortunes of life, than any other vocation, a humble, happy life. Given a farm of 500 acres, worth $50,000, and work it ten years. The natural interest of the old world, and now in the new, is from three to four per cent. That gives you, at the most, $2,000 a year to live upon, and you are a good manager if the years balance don't find you in debt, and why? Because society, custom and inclination will not permit the owner of 500 acres, to live in harmony with his income; because education, refinement and knowledge of the world's ways are expensive, and the habits of living are incompatible with the economies of rural life. Because you hire labor by the year and not by the piece, and because labor costs more than its produce will bring, and because the farm year

is twelve months long, and you turn your capital but once a year; while in trade you turn your capital with every sale, in manufacturing with every completed article, and with every turn of your capital you have taken your percentage of interest. On the other hand, the small farmer with his fifty acres of land at fifty dollars an acre, puts in his own labor, and from the proceeds of farm and labor, provides for his family and is contented.

Seven months of our year are adapted to farm work in some form, and may be profitably employed, but there are five months of enforced idleness to the farm laborer, and of leisure to the farmer. Whoever provides employment for his fellow-man, is a philanthropist. Profitable occupation is the key to happiness and contentment; the Garden of Eden had to be tilled; necessity is the guardian angel training us to habits of usefulness so that they become sources of happiness.

Whoever earns more than he expends, who produces more than he consumes, is a valuable member of society, a good citizen, a rich man. The surplus that we individually produce over and above what we consume, in the aggregate, is national wealth; it is the fund on which the nation draws in time of war, famine or pestilence. If he who makes two blades of grass grow where only one grew before, is a public benefactor, how much more is he who makes winter work on the farm a source of profit, and thus doubles the productive power of the year.

The productive power of the west, and the cheapness of transportation have made certain crops unprofitable and undesirable to raise; this is especially true of wheat, and of corn and oats as crops to be sold. The profits of raising beef and mutton have been materially reduced, but the value of hay continues, and the opportunity to feed cattle and sheep, fitting them for the market, has not been destroyed. Here we have a field still open to us for occupation and profit, but to feed profitably, we must guard against the inclemency of our climate, for flesh can not be added in extreme cold or under exposure to the storms of winter. Human labor is employed profitably by providing climate as well as factories to work in, and the length of days is equalized by furnishing light also. The farmer can guard against the elements with a similar promise of reward, if he will, and manufacture his raw material into the marketable article.

The dairy cow finds her surroundings more in harmony with her powers of production during the month of June than at any other period of the year; the nearer the farmer duplicates those influences and surroundings, the more certain he is of success, and the thing is possible, yes, practicable, as applied to winter farming. We provide for our families, and make our quarters comfortable; we make our own climate, whatever the weather is out of doors; we provide green food, vegetables, fruits for our own health and happiness; we have lengthened the span of human life, and quadrupled its ability to accomplish, and we have made it pleasanter to live. What we have done for ourselves, we can do for our stock, but what we do must be done at a profit to make it desirable and satisfactory; this will require the use of steam and the silo. What roots were to England in her mild climate and open winters, the silo will be for America, and more, it is the only thing that will save the agriculture of England, and permit her to support her farming community, guarding against her wet harvests. The chemist will tell you there is just as much nourishment in the hay as in the grass; the cow will look you in the face and deny it, or at least say that she can not find it there, and assimilate it, and the cow is right. There are places where the old way gives satisfaction, and the cost of preparation and the lack of means will prevent its adoption, but to the farmer in the State of New York, nothing has promised so satisfactory a solution of winter feeding, and possible profit, as the fact that green food can be preserved for winter use better and more economically than hay. Half an acre of land can produce the fodder for a cow for the whole year; add the meal usually fed, and the result surpasses the feeding of hay. If soiling is superior to pasturing, then by that much is ensilage better than soiling. In soiling, the first cutting is immature, then for a season it is in perfect condition, and afterward too old and woody to be good; with the silo, the crop is cut in exactly the best condition, and preserved in that state till used, and preparing it in quantity is cheaper than doing it daily, and by piece-meal.

It has been demonstrated by repeated experiments that three pints of yellow corn meal in the morning, and three pints of yellow corn meal at evening, will keep a 900-pound cow, in *statu quo*, and permit gestation, for three months at a time without injury, and *without any other food;* taking this as a measure of sustenance necessary for existence, you have the value of twenty-five pounds of

good hay, or sixty pounds of good ensilage, but the twenty-five pounds of hay represents 100 pounds of grass, and *you have practically lost* forty parts by curing.

The home market is a great advantage; Philadelphia, with a population of a million of inhabitants, spends annually $5,000,000 for milk; twenty-five dollars to each family of five, or on an average of five dollars a head. The average cow gives eight quarts a day for nine months in the year; 2,160 quarts at five cents is $108, and it is cheap food, but the average farmer receives only two cents a quart, and the income is forty-three dollars and twenty cents per cow; cheese must bring ten cents and butter twenty-five cents to produce this income.

Let me state a threatened danger to the dairy, in the rearing of calves; a fat calf tends to beef, not to milk, full feeding during the first year destroying the milk tendency and capacity; there seems a necessity of raising skim-milk calves if you wish to breed heavy milkers, and we must increase the productive power of the cow. Here we are met with a new opposition, a new addition to human food, the fat of cattle, called oleomargarine, or suet in its purity, wholesome, and butterine, a compound of lard and butter, and last though not least, a butter made from cotton-seed oil, pure, inodorous and free from taste, made and sold at about eight cents a pound, "to improve and increase the yield of our dairies," and particularly commended to our best dairymen. We know "that which goeth into a man defileth him not," but how the dairyman is *to keep himself honest* with such surroundings, how he can compete with the productions placed on the market, is a very serious question. It threatens the existence of a great industry. The State has attempted to correct the evil, but whether anything short of national legislation can cope with it is doubtful. There is no monopoly of production. There seems no limit to human devices, whether they be good or bad. The only protection to the dairy interest is in the superiority of the article produced.

I have endeavored to present by a combination of thoughts and facts disjointed as they are, a view in a general way of our surroundings, and of the condition of agriculture and production as it is to-day, and to verify it by recalling the past. With a population in 1830 of less than two millions, the State has now nearly five and a half millions, and the number of our farms has doubled, twice as many country homes as there were fifty years ago. Our farms

are smaller, but the same land provides for twice as many families, and provides more for each. He lives the highest life who lives most in harmony with nature. The man who fulfills all the duties of life, who marries, makes a home, has children, and works, who plans his labors, and does each day the work the day provides, and when night comes sleeps and rests, fills the measure of man's creation. I plead for moderation, respectable mediocrity you may call it, as the most satisfactory life to live, where all the duties are recognized and faithfully performed. The duties to your family, to society, (your fellow-man,) and to God, without any crazy ambition to be greater than your neighbor. Genius, talent, power, are the prerogatives of one in a hundred thousand or a million. Whoever has them, is "the slave of the lamp," and must do their bidding; they may bring great good to others, but to the man himself neither happiness nor contentment. He alone is rich whose income is greater than his wants, whose capital is safe, whose health is sound, and who is blest with a contented spirit. The life of the American farmer is more conducive to this result than any other vocation or calling.

Criticism has been indulged in, in regard to the management and conducting the affairs of this society. One feels at times that the old State society is slow, and that an infusion of new blood would quicken the action of the heart, and make more of a sensation, and I acknowledge to have shared in such views; but with a single years experience as president, with several years on its executive committee, I see less and less to criticize, as I realize the magnitude of each yearly exposition, and come to know the sincerity and disinterestedness of the men who give time, brains, experience and judgment fully and freely, for the advancement of the public good, and the welfare of the glorious commonwealth. Every exposition is a battle ground, every exhibitor a gladiator, wrestling with ideas, conceptions, inventions, demonstrations, comparisons, prejudiced by self-interest and occupation. And yet the awards of the society are sought for, and regarded as unprejudiced and just; seldom is an appeal made, or a verdict overruled. The transactions that are published are remarkably good; very little chaff can be found in the wheat. The articles are interesting, carefully written, and exhaustive, and the book worth a place in any library, but they should be annual and they should contain the report of the experimental farm at Geneva, so admirably conducted by Dr. Sturtevant.

and also the report of the agricultural department of Cornell University. We want the mistakes as well as the successes, for one is as useful as the other, in improving our knowledge and judgment. The progress of events is so rapid, and the results of careful experiments are so important and suggestive, that immediate publicity is imperative, and the farmers themselves demand that the results shall be put in their possession as soon as arrived at. If this is not done, the interest in these institutions will be lost, and they will lack the popular support essential to their perpetuity. What we want is familiarity with the knowledge that is current in 1885.

ANNUAL MEETING, 1886.

REPORT OF THE EXECUTIVE COMMITTEE.

The distinguishing characteristics of the agricultural season of 1885, in our State, were moderate temperature and abundant moisture. It was also somewhat remarkable for the absence of frost in the late spring and early autumn. Its conditions, generally, were thus favorable to at least an average product of grain and a greater than average growth of grass in meadows and pastures.

The results have been in accord with these conditions. The grain crops were large, but that of wheat was reduced by winter-killing in some counties, by Hessian fly in others, and all were somewhat injured by the wet weather in harvest time. The hay crop was a very large one, excepting in the Hudson river counties, in which the only drought of the season occurred at the critical time in May, and reduced the yield. Pastures have been good throughout the season and the product of cheese and butter has been large accordingly. The potato crop promised to be a very large one, but was reduced from one-third to one-half by rot, the loss in some localities being almost total. The crops of fruit, hops and tobacco were all above the average, so that in general the record is one of abundance, even after making allowance for the loss in potatoes and for the shrinkage of the wheat crop from the promise of a full average to an actual result about one-quarter less. The prices of all kinds of agricultural produce, however,

have become so low that the income of our farms has been less than in any recent year.

The health of farm animals has been good throughout the year; pleuro-pneumonia has not extended the area of its infection, and, owing no doubt to the abundant rain-fall, no outbreaks of anthrax have been heard of. The breeding interest in our State, as in general throughout the country, has felt the effect of the hard times most seriously.

The forty-fifth annual fair of the society was held at Albany, opening on the tenth and closing on the sixteenth of September, thus extending over parts of two weeks, an arrangement which, as in 1884, was found most satisfactory. The show of cattle was a very full and excellent one, especially in the Shorthorn, Ayrshire and Jersey classes, which more than made up for the falling off in Holsteins and Guernseys. The Devon class was well up to its usual good average in quality though not in numbers, and there was a larger entry of Herefords than usual. The new class of red-polled cattle brought out one exhibitor; that for brown Swiss, two, and that of polled Angus was blank.

In horses, the number was less than usual, being almost exactly the same as of the last fair held (in 1880) at Albany, but the quality, especially in the roadster classes, was superior.

There was a full and interesting show of sheep and swine, and the poultry exhibit under the newly arranged and increased list of premiums was most satisfactory both as to the number of entries and the quality of the stock. The competition among the manufacturers of incubators and brooders brought out a large and very attactive display of these appliances, which, as they begin to attain practical efficiency, command rapidly increasing attention.

In the implement department the display was fully up to the average, and perhaps more extensive than usual. The novelty in this part of the show was the number of self-moving and traction steam engines of American manufacture.

Of farm produce, there was a fairly good show of grain and vegetables, and better than usual of dairy products. In this department the instructive and extensive, admirably arranged exhibits of vegetables grown under varied conditions, at the State Experiment Station and at Houghton farm, attracted great attention.

The show of fruits and flowers was perhaps as good as usual. While there are exhibitors in this department who always do their

best to make it a success, and whose exhibits are most creditable both to themselves and to the society, the experience of the last ten or twelve years leads the committee to doubt whether its continuance is to be desired, in view of the expense and labor involved, and of the fact that the number of florists and fruit growers, professional or amateur, at any point where our fairs are held, who can be induced to contribute, seems to diminish rather than to increase.

The financial results of the fair, as shown by the treasurer's report, were very satisfactory. The large expense of preparation rendered necessary by the removal of a considerable number of the stalls and pens formerly on the grounds, and by the disrepair of the buildings, was to a large extent, offset by the liberal subscription made by the citizens of Albany, from which the sum of $3,880 has been realized. The weather was fine throughout, and the attendance was, under the new arrangement, so distributed that there were three days of large receipts without having on any one day so great a crowd as to exceed the means of transportation to and from the grounds.

Forty-six samples of fertilizers have been sent to the chemist of the society during the year. The returns of the analyses have been unavoidably delayed, so that they are not ready to be presented with this report.

The society was represented by ex-President Curtis, at the cattle-growers' conventions held at Chicago and St. Louis in November. It is a matter of congratulation that the debates and action of those meetings show a sounder public opinion on the subject of the suppression and prevention of contagious diseases of animals than has obtained at any previous time since that subject became one of serious and pressing importance in the United States.

The executive committee record with profound sorrow, the death of Mr. Samuel Campbell, of Oneida, which took place on the twenty-second of September. Mr. Campbell was president of the society in 1869, having previously served several times as a member of the executive committee. In him, the society loses an earnest friend and judicious counselor.

Mr. George Buckland, formerly professor of agriculture in University College, Toronto, and for many years secretary of the Agricultural and Arts Association of Ontario, died at Toronto in

April last, at the age of eighty-one. Professor Buckland was an early friend of the society, and delivered a very practical and instructive address at the Elmira fair in 1869.

In the death of Mr. Henry F. French, of Concord, Mass., on the twenty-ninth of November, at the age of seventy-three, the society loses another old and valued friend. Judge French's book on farm drainage has been a help to many farmers. He was one of the judges at the Auburn trial of mowers and reapers in 1866.

TREASURER'S REPORT.

Receipts.

Balance from account of 1884	$233 25	
Less for medals used during the year	90 31	
		$142 94
From State		8,000 00
From citizens' committee of Albany		3,880 00
From life memberships		70 00
From annual members' fees		629 00
From transportation account		141 10
From Albany fair, ticket sales	$24,411 99	
From Albany fair, refreshment privileges,	2,392 94	
From Albany fair, catalogues sold	183 22	
		26,988 15
		$39,851 19

Disbursements.

Expenses of annual meeting, Schedule "A"	$19 00
Expenses of previous years, Schedule "B"	2,395 38
Salaries and traveling expenses, Schedule "C"	4,179 75
Expenses of office, Schedule "D"	54 44
Postage, Schedule "E"	126 91
Library and museum, Schedule "F"	236 76
Printing and stationery, Schedule "G"	28 30
Elmira fair ground, Schedule "H"	466 65
Expenses of Albany fair, Schedule "I"	16,171 29
Premiums and premium expenses, Schedule "L"	9,453 11
Balance in bank	$6,604 07
Balance in office	115 35
	6,719 42
	$39,851 19

OFFICERS FOR 1886.

President.— James McCann, of Chemung county.

Vice-Presidents.—First district, Cornelius R. Agnew, of New York; Second district, Isaac H. Cocks, of Queens; Third district, Jared Van Wagenen, of Schoharie; Fourth district, Isaac V. Baker, Jr., of Washington; Fifth district, James Geddes, of Onondaga; Sixth district, Joseph Juliand, of Chenango; Seventh district, W. A. Wadsworth, of Livingston; Eighth district, Hezekiah Bowen, of Orleans.

Corresponding Secretary.— Thomas L. Harison, of St. Lawrence.

Recording Secretary.— William H. Bogart, of Cayuga.

Treasurer.— Adin Thayer, of Rensselaer.

Executive Committee.— Davis Cossitt, of Onondaga; Gerrit S. Miller, of Madison; C. C. B. Walker, of Steuben; Henry E. Alvord, of Orange; Thomas R. Proctor, of Oneida; F. O. Chamberlain, of Ontario; Oscar J. Lewis, of Rensselaer; J. S. Woodward, of Niagara.

Ex-Presidents.— Robert J. Swan, of Seneca; John D. Wing, of New York; George F. Mills, of Montgomery; William M. White, of Livingston; James W. Wadsworth, of Livingston.

SAMUEL CAMPBELL.

A memorial address before the State Agricultural Society at its annual meeting at Albany, January 20, 1886, by ELLIS H. ROBERTS.

Your society enjoyed for twenty-three years the labors and the counsels of a man who would be notable in any assemblage, and influential in any organization. Samuel Campbell was a picture of sturdy manhood, a presence marked by strength and power, when in 1862 he became a life member of this body. With a stature of six feet and a weight of 250 pounds, broad, symmetrical, and with the vitality of an athlete, his countenance and bearing gave token of a brain as massive and a character as robust as his physical form. As years went on, gray hairs and flowing beard brought a crown of glory, and commanded that veneration which noble age invites and individual achievements and worthy service to society

and the State hold sure and fast. Such a conception of power and brains and character Michael Angelo puts into his statue of Moses. Activity in a broad field, high aims strenuously pursued, devotion to the worthiest ends of humanity, sometimes carve out a figure which the sculptor's chisel can hardly rival. Your society welcomed Mr. Campbell, not only to membership, but to a share in its direction and control. In the first year after his name appears on your rolls, and again in 1864, he was chosen upon the executive committee; he became vice-president in 1867, and president in 1869. For five years thereafter he was an active member of your executive committee, and until his death he was one of your counselors, and retained a lively interest in your concerns. He gave to your affairs the energy, the sagacity, the strong will, the breadth of view and the liberality of action which marked his whole career.

While he was early trained to manufactures, he brought with him from Ayrshire, in Scotland, where he was born in 1809, a love for the soil and the air and the sun, which never left him. His large nature enjoyed the sweep of hill and valley and sky, and he turned for diversion from care and strain to the culture of the earth, and to the raising of cattle, and the manifold delights of the husbandman. The men are few who in the rich valley of the Mohawk, and on the beautiful hills that rise from it, farm a thousand acres. Mr. Campbell was one of these few. As an individual, and for his firm, he took pleasure in putting aside some capital into the soil, and in becoming the owner of the undulating and glorious landscape which spreads about the home where he showed the genial affection and hospitality of a patriarch.

The breadth of his manhood is illustrated by the fact that he acquired fame all over our country and Great Britain as the owner and breeder of blooded cattle, through his simple recreation. For the sake of diversion from his labors as a manufacturer he put on his farm some of the choicest stock which he could find. He imported and bred Ayrshires, Shorthorns and Jerseys, and won first prizes at county and State fairs. His herd of Ayrshires was pronounced the best in the country. In 1869 he bought of Mr. Sheldon, of Geneva, a very valuable herd. He became intensely interested, particularly in the Duchess strain of Shorthorns, and with his characteristic determination he wanted the best, and would have them. He purchased the purest animals of that strain in this country, and surprised his friends by the prices

which he was willing to pay for them. He prosecuted the enterprise with enthusiasm and with hearty enjoyment, until he had invested nearly $500,000 in his cattle.

When he had succeeded in securing the complete herd he desired, he found that the recreation was becoming a task. He did not wish to devote himself to raising cattle as a business. He was willing that the benefits of his collection should be divided. The sale of his herd in 1873 was at the time altogether the most important which our country had witnessed, and probably in the prices received, and the aggregate cash capital obtained for a single strain of cattle, it has never yet been equaled. Four cows were sold for $40,600, $35,000, $30,000 and $25,000, respectively, and the sale netted between $300,000 and $400,000. Mr. Campbell had secured the recreation which he had sought, and farmers may be glad to know that in addition his enterprise brought him a very satisfactory profit.

His ventures in blooded cattle were only an incident in his experience. He kept on to the end a practical farmer. While he gave to agriculture the solid common sense which swayed all his acts, he sought suggestions from all quarters, and aimed to get the best and latest results of science and investigation. With this spirit he was one of the originators and chief supports of the Central New York Farmers' Club, established in 1870, and he was elected president from year to year until his death. The club has had a steady, useful career, while many other organizations have arisen and passed away, and its vigorous life must be attributed in chief part to the regularity of his own attendance, and the spirit which he breathed wherever he went.

You will not understand me to say that Mr. Campbell was beyond all else a farmer. On the contrary, mother earth was to him only the delight of his leisure hours, the solace of care, the nurse of health and strength. Yet he doubtless gave to agriculture labor which would suffice to many for sole occupation. Garden and grapery, lawn and lakes, and well-tilled acres, testified to his love of things beautiful, and to a taste which visitors never failed to praise. His example may well inspire others to seek by like courtesies to nature the smiles and favors which she bestows in such abundant store.

In such a spirit Mr. Campbell turned to the soil and to cattle from the engrossing cares of a vast business. He was a manufac-

turer by the natural bent of his mind, by training, by study and experiment, by the enjoyment which comes from pronounced success. He brought with him from Scotland, in 1831, adaptation and skill, which found congenial employment in New York Mills. The cotton factory was in operation, but it needed just such mechanical sight and grasp and energy as he could give. Making cotton cloth was a field at that time where every improvement was possible. Mr. Campbell learned every part of the business, not only in its practice but in its scientific principles. He was skilled with his hands, but his brain was their master, and kept all the while in advance of them. Such a mechanic could not fail soon to become foreman, and in 1847 he became a partner in the establishment, which grew and thrived, largely under his management, until his death. He was associated with competent men of broad views and practical foresight. In the science and art of manufacturing, in forethought and sagacity, in planning and extending buildings and plants, and in improvements in processes, they would be first to accord to Mr. Campbell the palm of excellence. He wrought out, step by step, the progress which made the goods of New York Mills a standard in all markets. By the application of the scientific principles with which he had long been familiar, he established a bleachery in connection with the establishment, and at once turned out from it work equal to the best. He preferred to rely on his own skill and experiments, rather than on hired experts, and the results always confirmed his success in the varied and most difficult branches of manufacture.

Development and expansion, were inevitable with such skill and energy and power of will always busy. Factory after factory has been erected, until New York Mills is, as it has long been to a visitor who looks upon it from the hills that rise to the west, a series of busy factories and thrifty homes, with the signs of the activities of heart and mind, not often surpassed in any land; and an imagination not over vivid may discover there one of the nearest approaches to the "Happy Valley of Rasselas" that our country affords. The firm of Walcott & Campbell has not been content with material prosperity only. Gathered in the villages near the mouth of the Sauquoit is as intelligent, industrious and exemplary a community as the patriot or humanitarian can hope to see. While Mr. Campbell and his partners have felt the difficulties of the labor problem, they have ever maintained cordial

relations with the hundreds in their employ, have often borne sacrifices to keep the mills running in unprofitable seasons, and have in their tenements and by care for schools and churches and the intercourse which spreads sunshine over life, sought the welfare and elevation of all as neighbors and friends. When Mr. Campbell died, there was not a person in the three villages in which his firm is interested, who did not feel a personal loss. He was regarded as a patriarch, or more as an elder brother, whose strength and leadership had been a sure reliance, who had moved among them, toiling longer and more severely than any one else, always ready with a kind word for everybody, and doing myriad kindnesses wherever affliction befell, and avoiding every opportunity for recognition or thanks. The scene at his funeral was as eloquent a tribute as could be rendered by those among whom he had resided for fifty-four years. High and truthful words were uttered; the reverent and affectionate bearing, the hushed voices and the tears, hardly restrained, of a community that assembled to its last member about the bier, testified to the integrity, fidelity, worth, broad manhood of one before whom criticism was dumb, and whose career teaches men to think better of our humanity.

Many of you who hear me have known Mr. Campbell as a public man. He was one of the few who did not plead private obligations against summons to serve his fellow-citizens. In cases where great services were needed, he was a volunteer. No disparagement is made of the deserts of any one, when acknowledgment is recorded, that in enthusiasm and zeal, in practical and sustained labors and in lavish contributions, no person in central New York did more to raise and maintain the armies of the Union, and to relieve suffering in field and hospital, than did Mr. Campbell, and the monument in the village cemetery to the heroic dead is only one of many proofs that he never forgot the soldiers of the Republic. As supervisor of his town, as delegate to the Republican national convention of 1864, and by an influence which was positive and far-reaching, he contributed his part to the political creed to which he adhered, and to the cause of good government. He was elected to the Senate in 1865 and again in 1867, and he was a conscientious, painstaking law-maker. While he made no long speeches, he did his full share in molding the action of committees and in directing the course of legislation. He would have been thrust into other public stations, but he preferred to select

those whose vocation ran more into the channels of statutes and administration than his own, and to extend to them a generous and cordial friendship. If Oneida county has during the past generation had able and powerful representatives, distinguished throughout the State and the Union, they have been indebted for their start to the sturdy support and unflinching magnanimity of Samuel Campbell.

A sphere in which his heart as well as his business qualities were enlisted was that of manager of the New York State Lunatic Asylum at Utica. First appointed in 1862, he has by successive Governors been kept in place until a quarter of a century is nearly completed. To Governor Hoffman he wrote of the position: "I have considered it a public trust bestowed unsought, which I have always given attention to, however it might interfere with my own personal business." Since 1872 Mr. Campbell was president of the board, and not less than once a week, and when occasion required, more frequently, he visited the asylum and kept his eye on its affairs. He labored to get all available good results out of the munificent charity of the State. His sympathies were alive for the patients; he watched scrupulously over the appropriations intrusted to the management. He was proud of the institution and its administration, to which he consecrated so much of his care, and he resented unjust criticism and reckless denunciation with the consciousness which, as a faithful manager and a man of high honor, he had a right to feel.

Through his services in the Senate, and his connection with the State Agricultural Society, Mr. Campbell was thrown into close intimacy with Ezra Cornell, the large-hearted benefactor, who gave his name to the university which he founded. Mr. Campbell became one of its trustees, and was greatly interested in its development. He was a counselor who remembered his own early training in the classics, and he pleaded for fair space for them. As a practical man, working daily with his own hands as well as brains, he took delight in all efforts to wed science and the mechanic arts to university culture. His sympathies were with the liberal features of the institution. Cornell University lost a wise and generous friend when, three months before his death, Mr. Campbell resigned his seat at its board.

The home life of Mr. Campbell was like an idyl. Three generations mourned about his tomb. The best education for

descendants can be secured in his career; the best inspiration in his achievements, and the character all men accord to him; the richest possession in the example and the remembrance which will not fade away.

It is one of the treasures of my life to have known Mr. Campbell for thirty-five years, to have enjoyed his friendship, and during the whole period never to have had disagreement on the personal and public questions in which we had a common interest. I have used no license as a friend. I have tried to give his mien and bearing as he moved and acted on the broad plain of his activities. Our civilization, our organizations of whatever kind, find their richest blossom and fruit in a citizen so true, so broad of views, so diligent in labor, so strong of will, so tender of heart, so patriotic, so magnanimous. It is fitting that your society should preserve the aroma of such a memory.

HORATIO SEYMOUR.

Minute adopted by the Executive Committee, March 25, 1886.

The executive committee think it their duty, as it is their sad privilege, to place upon the record of their proceedings an expression of their sense of the loss sustained in the death of Horatio Seymour.

Called to the governorship of the State of New York at the most critical period in the history of our country, he was enabled by his wise statesmanship, his devotion to duty, his pure patriotism, his power as an administrator, his knowledge of the resources of the State, and by the influence of his personal character and address over the hearts and minds of his fellow citizens, to render services of the highest value to the State and nation.

Retired to private life, he did not lose interest in the public welfare, but devoted his leisure, the resources of a well-stored mind, the matured results of a broad experience, the power of ready and persuasive presentation and application, in speech and in writing, in aid of every object that he thought beneficent. As nothing was too high for his intellect, so nothing was too lowly for his philanthropy.

To a hearty recognition of the importance of agriculture, he added a thorough knowledge of its needs and of the directions in which its resources could be most readily and advantageously developed; and his interest in the Dairymen's Association, the farmers' clubs and agricultural societies of the State, and especially in the State Society, which he served as president in 1879, was always earnest and active.

It is ordered that this minute be recorded with the proceedings of the executive committee, and be appended to the report of the society to the Legislature.

ANNUAL MEETING, 1887.

REPORT OF THE EXECUTIVE COMMITTEE.

The crops of hay and grain in our State, the past season, have been almost uniformly good. The reports from the county societies generally characterize them as a full average or higher. It is not often that over so large an extent of country there is such general abundance, or that, in this broad State, with all the difference of soil, climate and agricultural management that exists, the record of the year's production is so generally favorable. The western group of counties, of the Genesee valley and Lake districts, suffer by the failure of the apple crop, so important to those counties. The corn crop was threatened by the bad weather at planting time and by the low temperature of the month of June, but was saved for the most part by the warmth of September and the lateness of the first frost. Wayne county reports a partial failure of the crop of peppermint, and Onondaga some damage to a large wheat crop by bad weather in harvest, with oats and corn less than a full crop, though the yield of barley was up to the average. In the central counties the tenor of the reports is almost the same, but the hay crop is stated as below average in Madison and Oneida, and the fruit crop, apples not being specially mentioned, as good or average in Oneida, Fulton, Otsego and Schoharie. Of the Hudson river counties, Washington reports "all crops above average," and the rest of the counties of the group, from which reports have been received, report the hay and grain crops as either good or above average;

potatoes and fruit being excepted in Dutchess and Putnam, corn and fruit in Columbia and Orange, and apples in Albany, while in Rockland and Queens there was some loss of potatoes by disease. Of the counties of the southern tier we have almost equally good reports, excepting that, while Tioga and Steuben report full average yields, the county of Chemung, lying between them, suffered quite severely from drought in both meadow and grain field, which cause operated also in Chautauqua to reduce the yield of hay and of potatoes. In the northern counties from which reports have been received the hay crop was of average weight and excellent quality, the grain crops were good, and the quantity of butter and cheese made was, as indeed, in all the dairy counties, larger than usual, notwithstanding short pastures late in the season, against which our dairy farmers make a provision of soiling crops.

The hop crop throughout the State has been almost an absolute failure, a serious calamity to the districts in which this most uncertain of all crops is of prominent importance.

The prices of grains continue very low, barley particularly being lower than last year. Dairy produce has brought better prices, taking the season through, than last year, but neat cattle, including beeves, cows and steers, are very low. Horses have been in some demand at prices better, relatively, than obtained for any other stock, while sheep and pigs have held their values, and wool has improved.

The health of farm stock has been good during the year; no serious or extensive outbreaks of anthrax have occurred, and no pleuro-pneumonia cases have been heard of north of New York city, where, as well as in Kings county, in the absence of State intervention, the boards of health of New York and Brooklyn are believed to be keeping the disease in check. The bronchial disease of calves, due to the presence of thread worms in the air passages, has occurred in one or two places.

The forty-sixth annual cattle show and fair of the society was held at Utica, upon the grounds known as the Driving Park, opening on the twenty-third, and closing on the twenty-ninth of September. The citizens of Utica raised, by subscription, the sum of $2,000, for the purpose of putting the buildings upon the park grounds in sufficient repair to be used for this fair. This sum was expended for that purpose by the general manager, and was accounted for to the citizens' committee, and, therefore, does not appear in the

accounts of the society. The weather throughout the fair was of an extremely unfavorable character, and the society thereby sustained a serious loss, which would have been much more serious but for the service rendered by the managers of the railroads running to Utica, in organizing excursions to the fair, and by otherwise inducing a larger attendance that under such circumstances would have been possible without their coöperation. The exhibition was the largest for many years, and the increased number of thoroughbred cattle, generally of very high merit, and especially in the Holstein class, was very gratifying. In all the classes of cattle the numbers were large and the quality good. There was an excellent show of horses, especially of the draught breeds, of stallions in the carriage and roadster classes and of saddle horses. The sheep and swine classes were good in numbers and in quality, and the poultry show was the best and largest in many years, a circumstance which is the more gratifying because it shows that the efforts of the society to increase the interest in this department, extending now over a number of years, have been appreciated by breeders, and as testifying to the good management of the department. The efficient services of Mr. D. F. Manning, the late superintendent, and of the present one, Mr. F. W. Gaylor, have largely contributed to this result. In the department of farm produce there was a very good display of the usual extent; the quality of the dairy produce exhibited was highly complimented by the judges. Of flowers and fruits there was a very pretty show, but, as usual, not so large as it would seem the interest of growers and the amount of premiums offered ought to bring out. The display of implements was a good one, and of the usual extent. The traction engines were shown in really practical operation, being made useful in hauling goods from the railroad into the grounds, a test of unusual severity, because the rains had made the roads very deep in mud. The novelty in machinery which attracted most attention was the new low-down self-binder, exhibited by the Rawson Manufacturing Company, and to be offered to the public the coming season.

The executive committee, at a meeting held in December, resolved to hold three farmers' institutes, meetings for the presentation of papers, essays and addresses on subjects connected with farming, and for the discussion of such subjects, during the present winter, in accordance with a plan reported by a subcommittee appointed at a meeting held at Utica in September. The first of

these meetings was held at Lockport on the thirteenth and fourteenth of January. It was supervised by the President, Vice-President Bowen and Mr. Woodward; was well attended, aroused a large local interest, and was an encouraging beginning for the undertaking. A second meeting is to be held, with the coöperation of the Faculty of Agriculture of Cornell University, at Ithaca, on the sixteenth, seventeenth and eighteenth of February. The third meeting is appointed to be held at the city of Oswego, on the second and third of March.

The chemical work of the society has been very little during the year past. Six samples of fertilizers have been received and transmitted to the chemist for analysis. Returns have been received of two sent in early in the year, and these call for no special remark. The returns of those sent in later have not yet been received.

The executive committee congratulate the society upon the improvement in the prospect of an effective effort being made to rid the country of the contagion of pleuro-pneumonia. The occurrence of this insidious and destructive disease west of the Alleghanies, transmitted from the infected districts on the seaboard, has suddenly and rudely dispelled the feeling of security in which the cattle men of the Western States and territories have so long rested. They seem now to be thoroughly aroused to vigorous, and, what is of equal, if not of greater importance, to intelligent and harmonious action. The bill introduced by the senior Senator from New York, and by the delegate from Wyoming, framed under the advice and with the approval of the officers and committee of the Consolidated Cattle Growers' Association of America, embodies the provisions for which this society, through its executive committee and under the advice of our consulting veterinarian, has always contended. These are, in brief, that authority be given by Congress to a special commission to go into every infected district, to every infected farm, not with the assertion of any arbitrary power to intervene in the affairs of the several States, but to act with the State authorities; not to confiscate property, however worthless, but to relieve the owners, at least partially, from the loss which their own negligence, or that of their fellow-citizens, has brought upon them. The bill proposes to extend to the cattle owners in the infected districts, the beneficence of the nation, while, at the same time, the general government exercises, in the

strictest sense, if not in the direction intended by its framers, the powers committed to it by the Constitution, "to provide for the common defense" against an enemy, sure, if let alone, to inflict more injury than would come from a war of arms, and "to promote the general welfare" in the protection of the most important source of the food supply of the country. The executive committee have done what was in their power to promote the success of the movement, and they invoke the aid of all the members of the society in their individual capacity, as well as collectively, to the same end. Should the pending bill become a law, they think that there is a reasonable prospect of the country being freed from the pest in a few years. They see no hope of this result being attained under any other plan that has been proposed.

Since the last annual meeting the society has had to mourn the loss of its venerable and honored ex-president, and early and constant friend, Horatio Seymour, of Oneida, who died on the twelfth of February, at the age of seventy-six. The executive committee paid their tribute to the memory of the eminent statesman and pure patriot in a minute, which was appended to the report for the year 1885, soon afterward transmitted to the Legislature. The executive committee record also, with deep regret, the deaths of Jurian Winne, of Albany; of G. G. Maxon, of Schenectady, and of D. D. S. Brown, of Monroe, life members, active in the work of the society, and of the venerable Marshall P. Wilder, of Massachusetts, whose name the society had, many years ago, the privilege of inscribing upon its roll of honorary members.

TREASURER'S REPORT.

Receipts.

Balance from account, 1885		$6,719 42
From appropriation for premiums		8,000 00
From citizens' committee of Albany		78 80
From sundry sources, viz.:		
Cartage refunded	$4 00	
Lost cheese sold	2 49	
Cash account over	10 81	
		17 30
From H. Bowen, general superintendent		800 00
From State		1,706 25
From life membership fees		160 00

From Utica fair:		
Ticket sales	$13,532 96	
Refreshment privileges	2,087 00	
Catalogues sold	154 75	
Annual memberships	680 00	
Transportation account	64 33	
		$16,519 04
		$34,000 01

Expenditures.

Expense of annual meeting, Schedule A		$1 28
Expense of previous years, Schedule B		1,414 82
Salaries and traveling expenses, Schedule C		5,586 36
Incidental expenses of secretary's office, Schedule D		64 27
Postage paid, Schedule E		85 12
Library and museum, Schedule F		385 38
Printing and stationery, Schedule G		846 62
Expenses of Elmira fair grounds, Schedule H		389 37
Expenses of Utica fair, Schedule I		10,118 36
Premiums and premium expenses, Schedule L		10,832 09
Institute expenses, Schedule M		195 12
Balance to new account:		
Cash in bank	$3,926 34	
Cash in treasurer's office	154 88	
		4,081 22
		$34,000 01

OFFICERS FOR 1887.

President.— James Geddes, of Onondaga.

Vice-Presidents. — First district, James Wood, of New York; Second district, Joseph H. Storm, of Dutchess; Third district, Jared Van Wagenen, of Schoharie; Fourth district, G. H. F. Van Horne, of Montgomery; Fifth district, W. Judson Smith, of Onondaga; Sixth district, Joseph Juliand, of Chenango; Seventh district, W. A. Wadsworth, of Livingston; Eighth district, Hezekiah Bowen, of Orleans.

Corresponding Secretary.— Jabez S. Woodward, of Niagara.

Recording Secretary.— William H. Bogart, of Cayuga.

Treasurer.— Adin Thayer, of Rensselaer.

Executive Committee. — Davis Cossitt, of Onondaga; Gerrit S. Miller, of Madison; C. C. B. Walker, of Steuben; William P. Richardson, of Orange; Thomas R. Proctor, of Oneida; F. O. Chamberlain, of Ontario; Oscar J. Lewis, of Rensselaer; Frank R. Redfield, of Genesee.

Ex-Presidents. — John D. Wing, of New York; George F. Mills, of Montgomery; William M. White, of Livingston; James W. Wadsworth, of Livingston; James McCann, of Chemung.

Consulting Veterinarian. — Prof. James Law, F. R. C. V. S.

STATE AGRICULTURAL ROOMS.

The office of the society is in Agricultural Hall, corner of State and Lodge streets, Albany.

OFFICERS OF KINDRED SOCIETIES FOR 1887.

NEW YORK STATE GRANGE.

Master.—W. A. Armstrong, Chemung.
Overseer.—W. C. Gifford, Chautauqua.
Lecturer.—J. B. Whiting, Seneca.
Steward.—E. F. Jones, Broome.
Assistant Steward.—U. D. Belles, Seneca.
Chaplain.—Rev. S. A. McKay, Wayne.
Treasurer.—Aaron Hedden, Tompkins.
Secretary.—H. H. Goff, Monroe.
Gate-Keeper.—Allan Potter, Cortland.
Pomona.—Mrs. Jennie B. Stone, Oswego.
Flora.—Mrs. B. B. Lord, Chautauqua.
Ceres.—Mrs. C. C. Poutins, Seneca.
Lady Assistant Steward.—Miss S. A. Little, Wayne.

Executive Committee.

Chairman.—F. F. Capen, Monroe.
Secretary.—A. J. Bartlett, Seneca.
Ex-officio.—A. D. T. Woolston, Cortland; W. A. Armstrong, Chemung; H. H. Goff, Monroe.

NEW YORK STATE SHEEP BREEDERS' ASSOCIATION.

President.— Davis Cossitt, Onondaga.
Vice-President.— Spencer D. Short, Honeoye.
Secretary.— J. Horatio Earle, Skaneateles.
Treasurer.— Howland Sherman, East Avon.
Executive Committee. — Peter Martin, Rush; J. D. Sullivan, Livonia Centre; J. J. Brainard, Attica.

NEW YORK STATE DAIRYMEN'S ASSOCIATION.

President.— John S. Shattuck, Norwich.
Vice-President.— Prof. I. P. Roberts, Ithaca.
Secretary.— Josiah Shull, Ilion.
Treasurer.— G. W. Burbank, Binghamton.
Directors.— Jesse Owen, Elmira; Flint Blanchard, Jamestown; E. F. Jones, Binghamton; Hiram Olmstead, Walton; Kenyon Terry, Norwich; William P. Richardson, Goshen.

NEW YORK STATE BEE KEEPERS' ASSOCIATION.

President.— W. E. Clark, Oriskany.
Vice-President.— Ira Barber, DeKalb Junction.
Secretary.— G. H. Knickerbocker, Pine Plains.
Treasurer.— J. L. Scofield, Chenango Bridge.

NEW YORK CANE GROWERS' ASSOCIATION.

President.— Malcom Little, Malcom.
Vice-President.— Isaac McKeel, Poplar Ridge.
Secretary.— C. L. Bigelow, Phelps.
Treasurer.— B. L. Foote, Deansville.

NEW YORK STATE HORSE BREEDERS' ASSOCIATION.

President.— Henry C. Jewett, Buffalo.
Vice-President.— Frank B. Redfield, Batavia.
Secretary and Treasurer.— M. E. Servoss, Rochester.

AWARDS

AT THE

FORTY-THIRD ANNUAL CATTLE SHOW AND FAIR OF THE NEW YORK STATE AGRICULTURAL SOCIETY, HELD AT ROCHESTER, SEPTEMBER 10–14, 1883.

CATTLE.

SHORTHORNS.

Shorthorn Herd Prize.

Palmer & Stewart, Hamlin, N. Y., large gold medal.

Bull, Mariner's Oxford, red roan, bred by Frank C. Cornell, Ithaca, N. Y.; calved December 22, 1879, sire Oxford Geneva, 24221, dam Mariner's Daisy by Mariner 2d, 17682, gr. d. Red Daisy 8th of Fairview by Financier, 11956.

Cow, Allenton Rose, red roan, bred by W. C. Allen, Allenton, N. Y.; calved February 25, 1877, sire Duke of Chestnut Grove, 21494, dam Kentucky Rose by General Sherman, 5709, gr. d. Rose by Young Duke, 6323.

Cow, Allenton Maid, red roan, bred by W. C. Allen, Allenton, N. Y.; calved April 15, 1877, sire Duke of Chestnut Grove, 21494, dam Daisy Maid 5th by Prince Nicholas, 11235, gr. d. Daisy Maid by Clearchus, 2636.

Cow, Lady Blanche 5th, white, bred by A. W. Griswold, Morrisville, Vt.; calved December 25, 1872, sire 4th Lord Oxford, 5903, dam Blanche by Sachem, 935, gr. d. Fayaway by Yorkshireman, 189.

Cow, Lady Thorndale, red and white, bred by Frank C. Cornell, Ithaca, N. Y.; calved May 12, 1880, sire Oxford Geneva, 24221, dam Miss Thorndale 2d by Duke Vanmeter, 11872, gr. d. Miss Thorndale by 11th Duke of Thorndale, 5611.

Heifer, Lady Eliza of Hamlin, red and white, bred by Frank Palmer, Hamlin, N. Y.; calved January 12, 1882, sire Mariner's Oxford, 36[illegible], dam Bloom by Royalist, 10923, gr. d. Lady Von Tromp by Kirklevington, 5860.

Shorthorn Bulls, over Three Years Old.

Daniel C. Munroe, Elbridge, N. Y.; first prize, fifty dollars; Earl of Clifton, red, bred by Charles M. Lansing, Niagara, Canada; calved May 17, 1879, sire Baron Percy, 28549, dam Countess of Belvoir by 22d Duke of Airdrie, 16695, gr. d. Campaspe 2d by 4th Grand Duke of Oxford, 5734.

Palmer & Stuart, Hamlin, N. Y.; second prize, twenty-five dollars; Mariner's Oxford, red roan, bred by Frank C. Cornell, Ithaca, N. Y.; calved December 22, 1879, sire Oxford Geneva, 24221, dam Mariner's Daisy by Mariner 2d, 17682, gr. d. Red Daisy 8th of Fairview by Financier, 11956.

Shorthorn Bulls, Two Years Old.

George H. Bell, Rome, N. Y.; first prize, forty dollars; Earl of Glen, red, bred by John H. Starin, Fultonville, N. Y.; calved March 14, 1881, sire Glen Oxford 2d, 32721, dam Maud 6th by Earl of Cambridge, 23018, gr. d. Maud 3d by Oxford Duke, 18775.

George Taber, East Aurora, N. Y.; second prize, twenty dollars; 6th Duke of Erie, roan, bred by Ira S. Adams, East Aurora, N. Y.; calved April 5, 1881, sire 3rd Duke of Erie, 29183, dam Frantic 26th by Oxford Duke 5th, 15076, gr. d. Frantic 16th by Victor, 7352.

Shorthorn Bulls, One Year Old.

Benjamin Fellows, Clifton, N. Y.; first prize, thirty dollars; Roan Duke 11th, red with little white, bred at Bow Park, Brantford, Canada.; calved March 30, 1882, sire Wild Eyes Duke, 34103, dam Roan Dutchess 21st by Duke of Oxford 38th, 26351, gr. d. Blanche 14th by 24th Duke of Oxford (31002).

M. B. Ritter, Waterloo, N. Y.; second prize, fifteen dollars; Senator, red, bred by James Russell, Richmond Hill, Ontario, Canada; calved February 5, 1882, sire British Statesman (42847), dam Isabella 4th by High Sheriff 2d, 39278, gr. d. Isabella by Wellington (32828).

Shorthorn Bull Calves.

William S. Moore, Mt. Upton, N. Y.; first prize, ten dollars; Duke of Upton, roan, bred by exhibitor; calved December 19, 1882, sire Pride of Upton dam Linda by Duke of Warwick, gr. d. Lilac by Duke of Ormond, 4746.

Daniel C. Munro, Elbridge, N. Y.; second prize, five dollars; Jude, red and white, bred by exhibitor; calved May 22, 1883, sire Earl of Clifton, 35370, dam Crummie 2nd by Major Booth, 30240, gr. d. Crummie by Royal Belleville, 12843.

Shorthorn Cows, over Three Years Old.

S. Spencer & Son, Kiantone, N. Y.; first prize, forty dollars; Conewango 4th, red roan, bred by exhibitors; calved March 6, 1877, sire 3rd Señor of Fairview, 20948, dam Maid of Genesee by Marmaduke, 5935, gr. d. Princess Beauty by Prince of Wales, 5100.

Palmer & Stuart, Hamlin, N. Y.; second prize, twenty dollars; Lady Blanche 5th, white, bred by A. W. Griswold, Morrisville, Vt.; calved December 25, 1872, sire 4th Lord Oxford, 5903, dam Blanche by Sachem, 935, gr. d. Fayaway by Yorkshireman, 189.

Shorthorn Heifers, Two Years Old.

Benjamin Fellows, Clifton, N. Y.; first prize, thirty dollars; La Belle, red and white, bred by exhibitor; calved October 21, 1880, sire Earl of Oxford, 35422, dam Red Rose 11th by Don John, 29063, gr. d. Red Rose 10th by 5th Duke of Hillsdale, 31487.

S. Spencer & Son, Kiantone, N. Y.; second prize, fifteen dollars; Conewango 11th, red with some white, bred by exhibitors; calved February 2, 1881, sire Bell Duke of Vinewood, 31788, dam Conewango 5th by 3rd Señor of Fairview, 20948, gr. d. Conewango by Baron of Oxford, 18631.

Shorthorn Heifers, One Year Old.

Palmer & Stuart, Hamlin, N. Y.; first prize, twenty dollars; Lady Eliza of Hamlin, red and white, bred by Frank Palmer, Hamlin, N. Y.; calved January 12, 1882, sire Mariner's Oxford, 36175, dam Bloom by Royalist, 10923, gr. d. Lady Van Tromp by Kirklevington, 5860.

S. Spencer & Son, Kiantone, N. Y.; second prize, ten dollars; Conewango 12th, white, bred by exhibitor; calved December 22, 1881, sire Highland Lad, 29835, dam 2d Maid of Genesee by Roderick Dhu, 12810, gr. d. Maid of Genesee by Marmaduke, 5935.

Shorthorn, Heifer Calves.

Palmer & Stuart, Hamlin, N. Y.; first prize, ten dollars; Lady Alice of Hamlin, red roan, bred by Isaac Palmer, Hamlin, N. Y.; calved December 10, 1882, sire Mariner's Oxford, 36175, dam Bloom by Royalist, 10923, gr. d. Lady Van Tromp by Kirklevington, 5860.

Daniel C. Munro, Elbridge, N. Y.; second prize, five dollars; Clytie, red, bred by exhibitor; calved February 21, 1883, sire Earl of Clifton, 35370, dam Bess by Major Booth, 30240, gr. d. Crochet 9th by Duke of Skaneateles, 26387.

DEVONS.

Devon Herd Prize.

Joseph Hilton, New Scotland, N. Y.; large gold medal,

Bull, Prince of Wales 20th, bred by exhibitor; calved December 12, 1878, sire Crown Prince, 434, dam Edith 9th by Prince of Wales, 151, gr. d. Fanny by Prince of Wales, 151.

Cow, Edith 12th, bred by exhibitor; calved December 12, 1875, sire Prince of Wales, 151, dam Edith 4th by Prince of Wales, 151, gr. d Edith 2d by Sachem, 1089.

Cow, Edith 14th, bred by exhibitor; calved January 3, 1878, sire Crown Prince, 434, dam Edith 4th by Prince of Wales, 151, gr. d. Edith 2d by Sachem, 1089.

Cow, Edith 16th, bred by exhibitor; calved February 9, 1879, sire Crown Prince, 434, dam Edith 12th by Prince of Wales, 151, gr. d. Edith 4th by Prince of Wales, 151.

Heifer, Lucy Crown, bred by exhibitor; calved March 3, 1881, sire Crown Prince, 434, dam Edith 13th by Prince of Wales, 151, gr. d. Edith 7th by Prince of Wales, 151.

Heifer, Lady Jane Edith, bred by exhibitor; calved January 8, 1882, sire Prince of Wales 20th, 1395, dam Edith 14th by Crown Prince, 434, gr. d. Edith 4th by Prince of Wales, 151.

Devon Bulls, over Three Years Old.

Joseph Hilton, New Scotland, N. Y.; first prize, fifty dollars; Prince of Wales 20th, bred by exhibitor; calved December 12, 1878, sire Crown Prince, 434, dam Edith 9th by Prince of Wales, 151, gr. d. Fanny by Prince of Wales, 151.

Charles W. Martin, South Worcester, N. Y.; second prize, twenty-five dollars; Duke Chenango, bred by E. M. Johnson & Son, Afton, N. Y.; calved April 10, 1877, sire Billy, 300, dam Red Rose by Sachem, 1089, gr. d. Primrose by Empire, 534.

Devon Bulls, Two Years Old.

A. F. Bronson, Vernon, N. Y.; first prize, forty dollars; Wonder, bred by exhibitor; calved May 10, 1881, sire Brant, 1344, dam Flora by Grant, 638, gr. d. Tilt by Dandy, 445.

A. W. Rumsey, Westfield, N. Y.; second prize, twenty dollars; True Briton, bred by William H. Jones, South Montrose, Pa.; calved May 14, 1881, sire Jones' Prince of Wales, 751½, dam Rose of May by Prince of Wales 12th, 1002, gr. d. Old Rose 3d by Comet, 420.

Devon Bulls, One Year Old.

Joseph Hilton, New Scotland, N. Y.; first prize, thirty dollars; Prince of Devons, bred by exhibitor; calved October 2, 1881, sire Prince of Wales 20th, 1395, dam Edith 12th by Prince of Wales, 151, gr. d. Edith 4th by Prince of Wales, 151.

B. F. Peck, East Bethany, N. Y.; second prize, fifteen dollars; Earl Genesee, bred by Truman Baker, Earlville, N. Y.; calved May, 1882, sire Willard, 2052, dam Crescent by Litchfield, 789, gr. d. Caroline by Genesee 2d, 616.

Devon Bull Calves.

A. W. Rumsey, Westfield, N. Y.; first prize, ten dollars; Daniel, bred by exhibitor; calved March 21, 1883, sire True Briton, dam Betsy by Bonaparte 2d, 328, gr. d. Clio by Baltimore 2d, 268.

Devon Cows, over Three Years Old.

Joseph Hilton, New Scotland, N. Y.; first prize, forty dollars; Edith 16th, bred by exhibitor; calved February 9, 1879, sire Crown Prince, 434, dam Edith 12th by Prince of Wales, 151, gr. d. Edith 4th by Prince of Wales, 151.

A. F. Bronson, Vernon, N. Y.; second prize, twenty dollars; Victoria, bred by George Rudd, Guelph, Canada; calved October 10, 1878, sire Prince Albert Victor, 227½, dam Maid of Honor by Hartland, 655, gr. d. Cherry Pie by Young Curly Prince of Wales, 440.

Devon Heifers, Two Years Old.

Joseph Hilton, New Scotland, N. Y.; first prize, thirty dollars; Lucy Crown, bred by exhibitor; calved March 3, 1881, sire Crown Prince, 434, dam Edith 13th by Prince of Wales, 151, gr. d. Edith 7th by Prince of Wales, 151.

A. F. Bronson, Vernon, N. Y.; second prize, fifteen dollars; Ellie Rhea, bred by George Rudd, Guelph, Canada; calved April 10, 1881; sire The Marquis, 1705, dam Blossom by Dandy, 447, gr. d. Miss Ann by Hartland, 655.

Devon Heifers, One Year Old.

A. F. Bronson, Vernon, N. Y.; first prize, twenty dollars; Red Bud bred by exhibitor; calved May 11, 1882, sire Jeddo, 1809, dam Nameless 2d by Doctor, 462, gr. d. Nameless by Litchfield, 789.

A. F. Bronson, Vernon, N. Y.; second prize, ten dollars; Winchester Girl, bred by exhibitor; calved February 13, 1882, sire Brant, 1344, dam Cherry by Conewango, 428, gr. d. Fruitful by Roscius, 1071.

Devon Heifer Calves.

Joseph Hilton, New Scotland, N. Y.; first prize, ten dollars; Maid of Utica, bred by exhibitor; calved September 25, 1882, sire Prince John H., dam Edith 12th by Prince of Wales, 151, gr. d. Edith 4th by Prince of Wales, 151.

Joseph Hilton, New Scotland, N. Y.; second prize, five dollars; Miss Nancy New, bred by exhibitor; calved January 16, 1883, sire Prince of Wales 20th, 1395, dam Edith 14th by Crown Prince, 434, gr. d. Edith 4th by Prince of Wales, 151.

HEREFORDS.

Hereford Herd Prize.

Erastus Corning, Albany, N. Y.; large gold medal.

Bull, Comus, red with white face, bred by P. Turner, Pembridge, Hereford, England: calved July 21, 1872, sire Provost (4067), dam Kathleen by Bolingbroke (1883), gr. d. Redwing by Felix (953).

Cow, Victoria 6th, red with white face, bred by exhibitor; calved June 12, 1874, sire Taurus, dam Victoria 5th by S. Goddard, gr. d. Victoria 4th by Cardinal Wiseman.

Cow, Edna, red with white face, bred by exhibitor; calved February 9, 1879, sire Comus (4457), dam Victoria 6th by Taurus, gr. d. Victoria 5th by S. Goddard.

Cow, Filbert, red with white face, bred by exhibitor; calved February 2, 1879, sire Comus (4457), dam Princess 3d by Major, gr. d. Princess 2d by Washington, (5134).

Cow, Dorcas 5th, red with white face, bred by Philip Turner, The Leen, Pembridge, Herefordshire, England; calved March 31, 1880, Sire Corsair (5271), dam Dorcas 4th by Leominster (3910), gr. d. Dorcas 3d by Bachelor (2941).

Cow, Dutchess 8th, red with white face, bred by John Price, Pembridge, Herefordshire, England; calved June 7, 1880, sir Regulus (4076), dam Dutchess 5th by Horace (3877), gr. d. Dutchess by Cholstrey (1918).

Hereford Bulls, over Three Years Old.

Erastus Corning, Albany, N. Y.; first prize, fifty dollars; Comus, red with white face, bred by P. Turner, Pembridge, Hereford, England; calved July 21, 1872, sire Provost (4067), dam Kathleen by Bolingbroke (1883), gr. d. Redwing by Felix (953).

Hereford Bulls, Two Years Old.

John L. Northrup, Westfield, N. Y.; first prize, forty dollars; Santa-Claus, red with white face, bred by H. T. Smith, Berlin Heights, O; calved December 25, 1880, sire Young America 4231, dam May Queen by Bristol Bill (4374), gr. d. Dutchess 2d by John Bull (3885).

Hereford Bull Calves.

Erastus Corning, Albany, N. Y.; first prize, ten dollars; Kenwood, red with white face, bred by exhibitor; calved December 20, 1882, sire Romeo (6646), dam Comely by sire Isaac (5598), gr. d. Caroline by Chadnor 2d (5244).

Hereford Cows, over Three Years Old.

Erastus Corning, Albany, N. Y.; first prize, forty dollars; Filbert, red with white face, bred by exhibitor; calved February 2, 1879, sire Comus (4457), dam Princess 3d by Major, gr. d. Princess 2d by Washington (5134),

Erastus Corning, Albany, N. Y.; second prize, twenty dollars; Edna, red with white face, bred by exhibitor; calved February 9, 1879, sire Comus (4457), dam Victoria 6th by Taurus, gr. d. Victoria 5th by S. Goddard.

Hereford Heifers, One Year Old.

Erastus Corning, Albany, N. Y.; first prize, twenty dollars; Edna 2d, red with white face, bred by exhibitor; calved December 31, 1881, sire Comus (4457), dam Edna by Comus (4457), gr. d. Victoria 6th by Taurus.

Hereford Heifer Calves.

John L. Northrup, Westfield, N. Y.; first prize, ten dollars; Charmer 3d, red with white face, bred by exhibitor; calved April 7, 1883, sire Thickset (6729), dam Charmer 2d by Premier (4852), gr. d. Charmer by Dorset (3070).

AYRSHIRES.

Ayrshire Herd Prize.

J. F. Converse, Woodville, N. Y.; large gold medal.

Bull, Major Drummond, mostly red, bred by James Drummond, Montreal, Canada; calved March, 1876, sire Sir Roger, 868, dam Medora, imported by James Drummond.

Cow, Lady Cherry, red, bred by exhibitor; calved June, 1875, sire Woodville Chief, 1542, dam Bessie Bell, imported by exhibitor in 1871.

Cow, Miss Pender, red and white, bred by exhibitor; calved April 13, 1875, sire Woodville Chief, 1542, dam Lady Pender, imported by exhibitor in 1871.

Heifer, Gertie Gillette, red, bred by exhibitor; calved April, 1881, sire Prince Charley, 1689, dam Bessie Bell, imported by exhibitor in 1871.

Heifer, Hattie Hebe, light red and white, bred by exhibitor; calved June, 1881, sire Prince Charley, 1689, dam Dahlia, imported by exhibitor in 1871.

Heifer, Josie Douglass, red and white, bred by exhibitor, calved April, 1881, sire Prince Charley, 1689, dam Dahlia 3d by Woodville Chief, 1542, gr. d. Dahlia, imported by exhibitor in 1871.

Ayrshire Bulls, over Three Years Old.

J. F. Converse, Woodville, N. Y.; first prize, fifty dollars; Major Drummond, mostly red, bred by James Drummond, Montreal, Canada; calved, March, 1876, sire Sir Roger, 868, dam Medora, imported by James Drummond.

Burton G. Foster, Vernon, N. Y.; second prize, twenty-five dollars; King of Vernon, dark red and white, bred by Oneida Community, limited, Community, N. Y.; calved March 28, 1880, sire Kilmarnock 25th, 2329, dam Joan, imported January 10, 1879, by P. H. Fowler, Watford, Herts, England.

Ayrshire Bulls, Two Years Old.

David Smith, Rome, N. Y.; first prize, forty dollars; Royal Windsor, red and white, bred by G. H. Bell, Rome, N. Y.; calved March 28, 1881, sire Jerry, dam Draxy Miller by 224 Treasurer,* gr. d. Pet by 200 Rob Roy.

Henry Burnett, Logan, N. Y.; second prize, twenty dollars; Major B. bred by C. D. Smead, Logan, N. Y.; calved 1881, sire Jock, dam Dairy Maid by Mikado, 2251, gr. d. Lilly Miller by Lord Cuthbert 77.

Ayrshire Bulls, One Year Old.

George H. Bell, Rome, N. Y.; first prize, thirty dollars; Winfield Boy 3d, red and white, bred by exhibitor; calved March 17, 1882, sire Winfield Boy, 2610, dam Draxy Miller by 224 Treasurer, gr. d. Pet by 200 Rob Roy.

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* When the numbers of Ayrshire bulls are printed before the names the reference is to Messrs. Sturtevant's Register.

James M. Thomas, Cuba, N. Y.; second prize, fifteen dollars, Heather Jock 2d, red and white, bred by exhibitor; calved March 2, 1882, sire 611 Heather Jock, dam Melvina by 487 Stentor 2d, gr. d. Tibbie by 119 John Gilpin.

Ayrshire Bull Calves.

J. F. Converse, Woodville, N. Y.; first prize, ten dollars; Dandie Douglass, red and white, bred by A. S. Tubbs, Mexico, N. Y.; calved November, 1882, sire Shirley Douglass, 2742, dam Dahlia 2d by Woodville Chief, 1542, gr. d. Dahlia, imported by exhibitor in 1871.

Ayrshire Cows, over Three Years old.

J. F. Converse, Woodville, N. Y.; first prize, forty dollars; Miss Pender, red and white, bred by exhibitor; calved April 13, 1875, sire Woodville Chief, 1542, dam Lady Pender, imported by exhibitor in 1871.

George H. Bell, Rome, N. Y.; second prize, twenty dollars; Lillie, red and white, bred by S. Dering, Utica, N. Y.; calved April 24, 1878, sire 853 Kilmarnock 2d, dam Draxy Miller by 224 Treasurer, gr. d. Pet by 200 Rob Roy.

Ayrshire Heifers, Two Years Old.

Burton G. Foster, Vernon N. Y.; first prize, thirty dollars; Belle of Vernon, red and white spotted, bred by exhibitor; calved March 13, 1881, sire Hugo, 2323, dam Pet Brown by 958 The General, gr. d. Pet by 200 Rob Roy.

J. F. Converse, Woodville, N. Y.; second prize, fifteen dollars; Josie Douglass, red and white, bred by exhibitor; calved April, 1881, sire Prince Charlie, 1689, dam Dahlia 3d by Woodville Chief, 1542, gr. d. Dahlia, imported by exhibitor in 1871.

Ayrshire Heifers, One Year Old.

George H. Bell, Rome, N. Y.; first prize, twenty dollars; Daisy Tresham 2d, red and white, bred by exhibitor; calved February 21, 1882, sire Winfield Boy, 2610, dam Daisy Tresham by 853 Kilmarnock 2d, gr. d. Kate Tresham by Norval, 762.

George Taber, East Aurora, N. Y.; second prize, ten dollars; Altis, brown and white, bred by exhibitor; calved March 3, 1882, sire Premier, 2321, dam Goldena 2d by Dundee, 1111, gr. d. Goldena by Kilmarnock, 1245.

Ayrshire Heifer Calves.

J. F. Converse, Woodville, N. Y.; first prize, ten dollars; Waiting for an Offer, red and white, bred by exhibitor; calved October, 1882, sire Major Drummond, 2006, dam Rosa 5th by Woodville Chief, 1542, gr. d. Rosa by Kilburn 2d, 230.

George H. Bell, Rome, N. Y.; second prize, five dollars; Maggie Mitchell 5th, red and white, bred by exhibitor; calved September 27, 1882, sire Winfield Boy, 2610, dam Maggie Mitchell 2d, by 853 Kilmarnock 2d, gr. d. Maggie Mitchell by 958 The General.

HOLSTEINS.

Holstein Herd Prize.

Smiths & Powell, Syracuse, N. Y.; large gold medal.

Bull, Netherland Prince, black and white, bred by A. C. Koning, Beemster, North Holland; calved April 1, 1880, sire Schemmel, dam Lady Netherland.

Cow, Ægis, black and white, bred by Gerrit S. Miller, Peterborough, N. Y.; calved October 2, 1873, sire Rip Van Winkle, 35, dam Agoo, imported by Mr. Miller in dam Dowager.

Cow, Netherland Baroness, black and white, bred by Jan van der Meer, Beemster, North Holland; calved March 15, 1877, sire District Bull, dam Gert Met 3d.

Cow, Netherland Queen, black and white, bred by A. C. Koning, Beemster, North Holland; calved March 26, 1877, sire Schrender, dam Lady Netherland.

Cow, Carlotta, black and white, bred by C. Beets, Purmer, North Holland; calved March, 1879, sire District Bull.

Cow, Clothilde, black and white, bred by J. Stijle, Beemster, North Holland; calved March, 1879, sire Dirk, dam Stijle.

Holstein Bulls, over Three Years Old.

F. C. Stevens, Attica, N. Y.; first prize, fifty dollars; De Jouster Stier, black and white, bred by Klaus S. De Yong, Haskerdyken, Friesland; calved March, 1880.

Smiths & Powell, Syracuse, N. Y.; second prize, twenty-five dollars; Netherland Prince, black and white, bred by A. C. Koning, Beemster, North Holland; calved April 1, 1880, sire Schemmel, dam Lady Netherland.

Holstein Bulls, Two Years Old.

F. C. Stevens, Attica, N. Y.; first prize, forty dollars; Prince of Wayne 2d, black and white, bred by T. G. Yeomans & Sons, Walworth, N. Y.; calved March 27, 1881, sire Burly, 394, dam Queen of Wayne, imported Sept. 10, 1879, by T. G. Yeomans & Sons, Walworth, N. Y.

Howard G. White, Syracuse, N. Y.; second prize, twenty dollars; Prince Bismarck, black and white, bred by exhibitor; calved February 20, 1881, sire Corugian, 424, dam Vlaaske, imported September 7, 1878, by exhibitor from North Holland.

Holstein Bulls, One Year Old.

H. E. Boardman, Rochester, N. Y.; first prize, thirty dollars; Thierry, black and white, bred by G. Wydenes, Jr., Twisk, North Holland; calved March 26, 1882, imported by exhibitor.

Smiths & Powell, Syracuse, N. Y.; second prize, fifteen dollars; Prince Imperial, black and white, bred by exhibitors; calved April 15, 1882, sire Netherland Prince, 716, dam Carlotta, imported by exhibitors.

Holstein Bull Calves.

F. C. Stevens, Attica, N. Y.; first prize, ten dollars; Grip, black and white, bred by exhibitor; calved March 9, 1883, sire Damon, 831, dam Francisca 2d by 5th Prince of Orange, 243, gr. d. Francisca, imported in 1878 by Smiths & Powell, Syracuse, N. Y.

Smiths & Powell, Syracuse, N. Y.; second prize, five dollars; Sir Edward of Aaggie, black and white, bred by exhibitors; calved February 23, 1883, sire Van de Graag (166), dam Aaggie Louise (imported by exhibitors in September, 1882), by Jacob 2d, (56).

Holstein Cows, over Three Years Old.

Smiths & Powell, Syracuse, N. Y.; first prize, forty dollars; Clothilde, black and white, bred by J. Stijle, Beemster, North Holland; calved March, 1879, sire Dirk, dam Stijle.

Howard G. White, Syracuse, N. Y.; second prize, twenty dollars; Princess Dagmar, black and white, bred by exhibitor; calved February 11, 1879, imported in dam Vlaaske, September 7, 1878, by exhibitor from North Holland.

Holstein Heifers, Two Years Old.

Dallas B. Whipple, Cuba, N. Y.; first prize, thirty dollars; Holland Pride, black and white, bred by M. Noome, Wormer, North Holland; calved April 7, 1881, imported by Smiths & Powell, Syracuse, N. Y., in July, 1881, sire Noome's Bull, dam Potta.

Smiths & Powell, Syracuse, N. Y.; second prize, fifteen dollars; Miss Nanna, black and white, bred by J. Commandeur, Hem, North Holland; calved March 25, 1881, sire District Bull, dam Sijtje.

Holstein Heifers, One Year Old.

Smiths & Powell, Syracuse, N. Y.; first prize, twenty dollars; Ægis 6th, black and white, bred by exhibitors; calved October 12, 1881, sire Neptune, 711, dam Ægis 2d by Uncle Tom, 163, gr. d. Ægis by Rip Van Winkle, 35.

Fitch & Jewett, West Farmington, N. Y.; second prize, ten dollars; Mabel Livingston, black and white, bred by A. Van der Nes, Purmer, North Holland; calved March 20, 1882, imported by Smiths & Powell, Syracuse, N. Y., in August, 1882, sire Bull of A. Van der Nes, dam Sires Boutje.

Holstein Heifer Calves.

Smiths & Powell, Syracuse, N. Y.; first prize, ten dollars; Ægis 9th, black and white, bred by exhibitors; calved November 4, 1882, sire Neptune, 711, dam Ægis by Rip Van Winkle, 35, gr. d. Agoo, imported.

Smiths & Powell, Syracuse, N. Y.; second prize, five dollars; Prunella 2d, black and white, bred by exhibitors; calved March 1, 1883, sire Doets' Bull in Holland, dam Prunella, imported by exhibitors in August, 1882.

JERSEYS.

Jersey Herd Prize.

S. M. Shoemaker, Stevenson, Md.; large gold medal.

Bull, Forget-me-not, dark gray, bred by J. Norman, Trinity, Jersey; calved February 7, 1880, imported August 20, 1881, by Cooper, Maddux & Co., Reading, Ohio, sire Farmer's Glory, 5196, dam Erica (F. S. 1946 J. H. B.).

Cow, Oxford Kate, light brown, bred by Francis Le Brocq, St. Peter's, Jersey; calved February 20, 1879, sire (Pilot, P. S. 183 J. H. B.) dam Verclut (F. S. 1846 J. H. B.), imported August 20, 1881, by Cooper, Maddux & Co., Reading, Ohio.

Cow, Princess 2d, light fawn, bred by A. Le Gallais, St. Prelades, Jersey; calved February 22, 1877, sire Khedive (P. S. 103 J. H. B.), dam Princess (F. S. 452 J. H. B.), imported January 8, 1879, by E. P. P. Fowler, Southampton, England.

Cow, Queen of the Farm, dark brown, bred by Charles Holt, Grouville, Jersey; calved 1875, imported August 6, 1879, by William Holt.

Cow, Miss Muffet, dark gray, bred by Cornelius Wellington, East Lexington, Mass.; calved November, 9, 1878, sire Major Domo, 2161, dam Ruth, imported March 23, 1869, by Wm. R. Robeson, Boston, Mass.

Heifer, First Butterfly, dark brown, bred by John I. Holly, Plainfield, N. J.; calved June 20, 1882, sire Uproar, 4609, dam Queen of the Farm, imported August 6, 1879, by William Holt.

Jersey Bulls, over Three Years Old.

Erastus Corning, Albany, N. Y.; first prize, fifty dollars; Diavolo, gray, fawn and black, bred by exhibitor; calved July 31, 1879, sire Stockwell 3d, 2770, dam Tranquility by Stockwell 3d, 2770, gr. d. Daisy Mortua, imported by exhibitor September 29, 1873.

S. M. Shoemaker, Stevenson, Md.; second prize, twenty-five dollars; Forget-me-not, dark gray, bred by J. Norman, Trinity, Jersey; calved February 7, 1880, imported August 20, 1881, by Cooper, Maddux & Co., Reading, Ohio, sire Farmer's Glory, 5196, dam Erica (F. S. 1946 J. H. B.).

Jersey Bulls, Two Years Old.

J. B. Bradley, Lyons, N. Y.; first prize, forty dollars; Glaucus, fawn, bred by exhibitor; calved March 10, 1881, sire Troy, 5404, dam Maple Dale by Victor, 797, gr. d. Susa, imported July 29, 1868, by Thomas Motley, Boston, Mass.

A. G. Chriswell, Adams' Basin, N. Y.; second prize, twenty dollars; Elegant Boy, fawn, bred by A. G. Barlow & Co., North Ridgeway, N. Y.; calved March 9, 1881, sire Bristol Chief 2d, 3218, dam Kitty Marcella by Earl of Brookside, 1677, gr. d. Kobe's Marcella by Star Neal, 1495.

Jersey Bulls, One Year Old.

L. L. Tozier, Batavia, N. Y.; first prize, thirty dollars; Clotaire, black and fawn, bred by Cooper, Maddux & Co., Coopersburgh, Pa.; calved April 19, 1882, sire Royal Oak, 6219, dam Floribundus 2d, imported August 20, 1881, by Cooper, Maddux & Co.

L. D. Ely, Rochester, N. Y.; second prize, fifteen dollars; Albert Mc., dark squirrel gray, bred by exhibitor; calved May 8, 1882, sire Seneca Chief, 4098, dam Gipsy Maid 3d by Guido, 3521, gr. d. Gipsy Maid by Pure Gold, 1487.

Jersey Bull Calves.

S. M. Shoemaker, Stevenson, Md.; first prize, ten dollars; Burnside Park, dark gray, bred by exhibitor; calved October 28, 1882, sire Forget-me-not, 6291, dam Owandah by Knave, 1856, gr. d. Dorette by Lord Ogden, 69.

H. Bowen, Medina, N. Y.; second prize, five dollars; Easter Lad, gray and white, bred by James Stillman, Sing Sing, N. Y.; calved October 18, 1882, sire Darlington, 2443, dam Easter Flower by Colt, Jr., 825, gr. d. Couch's Lily by Albert, 44.

Jersey Cows, over Three Years Old.

S. M. Shoemaker, Stevenson, Md.; first prize, forty dollars; St. Clementaise, gray fawn, bred by Philip Baudains, St. Clements, Jersey; calved 1871, imported November 20, 1882, by T. S. Cooper, Coopersburgh, Penn.

S. M. Shoemaker, Stevenson, Md.; second prize, twenty dollars; Oxford Kate, light brown, bred by Francis Le Brocq, St. Peters, Jersey; calved February 20, 1879, sire Pilot (P. S. 183, J. H. B.), dam Verclut (F. S. 1846, J. H. B.), imported August 20, 1881, by Cooper, Maddux & Co., Reading, Ohio.

Shepard & Peer, Mt. Morris, N. Y.; highly commended; Mollie Garfield; fawn, bred by C. E. Marsh, Evansville, Ind.; calved April, 1876, sire Bel Caliph, 1432, dam Maple Dale by Victor, 797, gr. d. Susa, imported July 29, 1863, by Thomas Motley, Boston, Mass.

L. L. Tozier, Batavia, N. Y.; highly commended; Floribundus 2d, fawn and white, bred by J. Le Brocq, St. Mary's, Jersey; calved February, 1879, imported August 28, 1881, by Cooper, Maddux & Co., Coopersburg, Penn., sire Victor (P. S. 148, J. H. B.), dam Floribundus (P. S. 659, J. H. B.).

Jersey Heifers, Two Years Old.

H. W. Skerritt, Deansville, N. Y.; first prize, thirty dollars; Belle Steuben, orange fawn, bred by Dr. J. C. Gallup, Clinton, N. Y.; calved July 18, 1881, sire Steuben, 4751, dam Elsie Dinsmore by Jason of Deerfoot, 1636, gr. d. Hattie Parks by Duke of Framingham, 1521.

Shepard & Peer, Mt. Morris, N. Y.; second prize, fifteen dollars; Bessie Flash, cream fawn, bred by John McClennan, Woodstock, Conn.; calved February 25, 1881, sire Flash, 2532, dam Flash by Hughes, 954, gr. d. Lady Dash by Tom Dasher, 420.

Jersey Heifers, One Year Old.

S. M. Shoemaker, Stevenson, Md.; first prize, twenty dollars; First Butterfly, dark brown, bred by John I. Holly, Plainfield, N. J.; calved June 20, 1882, sire Uproar, 4609, dam Queen of the Farm, imported August 6, 1879, by William Holt.

J. B. Bradley, Lyons, N. Y.; second prize, ten dollars; Notice, fawn, bred by exhibitor; calved March 10, 1882, sire Bel Caliph, 1432, dam Maple Dale by Victor, 797, gr. d. Susa, imported July 29, 1863, by Thomas Motley, Boston, Mass.

Jersey Heifer Calves.

H. Bowen, Medina, N. Y.; first prize, ten dollars; Dido's Duke's Daughter, dark fawn, bred by Edwin Thorne, Millbrook, N. Y.; calved October 24, 1882, sire Dido's Duke, 4678, dam Little Buttercup of Ipswich by Duke Jr., 2465, gr. d. Maud Duchess by Royal Duke of Ipswich, 1590.

L. L. Cramer, Macedon, N. Y.; second prize, five dollars; Maud Alexis, light fawn, bred by G. P. Lapham, Macedon, N. Y.; calved April 10, 1883, sire Troy, 5404, dam Belle of Wayne by Sir Farmington, 3316, gr. d. Belle of Canandaigua by Croton, 2348.

GUERNSEYS.

Guernsey Bulls, Three Years Old.

B. F. Nutting, Woodville, N. Y.; first prize, fifty dollars; Og, fawn and white, bred by E. Norton, Farmington, Conn.; calved April, 1878, sire, Malbrook, 23, dam Princess, bred by M. Langlois, Guernsey, and imported April, 1876, by M. C. Weld, Closter, N. J.

Guernsey Bulls, Two Years Old.

A. S. Shimer, Redington, Penn.; first prize, forty dollars. King of Central Fruit and Stock Farm, fawn and white, bred by James Fuller, Catisauqua, Penn.; calved December 7, 1880, sire Fair Lad, 71, dam Rose Martin, imported December, 1877, by E. P. P. Fowler, Southampton, England.

Howard G. White, Syracuse, N. Y.; second prize, twenty dollars; Duke of Fernwood, light orange fawn and white, bred by L. W. Ledyard, Cazenovia, N. Y.; calved July 31, 1881, sire Fernwood, 190, dam Fernwood Fancy, imported by C. M. Beach, Hartford, Conn.

Guernsey Bulls, One Year Old.

A. S. Shimer, Redington, Penn.; first prize, thirty dollars, General of Central Fruit and Stock Farm, fawn and white, bred by James Fuller, Catisauqua, Penn.; calved April, 1882, sire Fair Lad 2d, 75, dam Lilly 3d by Fair Lad, 71, gr. d. Lily, imported October, 1872, by E. P. P. Fowler, Southampton, England.

Guernsey Cows, over Three Years Old.

Howard G. White, Syracuse, N. Y.; first prize, forty dollars; Olivette, orange fawn and white, bred by Augustus Ward, Farmington, Conn.; calved, March 6, 1880, sire Dom Pedro, 52, dam La Gelé, imported in April, 1876, by M. C. Weld, N. Y.

Guernsey Heifers, Two Years Old.

Howard G. White, Syracuse, N. Y.; first prize, thirty dollars; Serpolette, orange fawn and white, bred by Augustus Ward, Farmington, Conn.; calved March 19, 1881, sire Dom Pedro, 52, dam La Gelé, imported in April, 1876, by M. C, Weld, New York.

Guernsey Heifers, One Year Old.

B. F. Nutting, Woodville, N. Y.; first prize, twenty dollars; Beauty of Lakeside, fawn and white, bred by Thomas M. Harvey & Son, West Grove, Penn.; calved ——, sire Sir Champion, 38, dam Carrie of Green Bank by Pilgrim, 14, gr. d. Carrie by Robin Hood, 5.

Guernsey Heifer Calves.

A. S. Shiner, Redington, Penn.; first prize, ten dollars; Apple Peel, fawn and white, bred by exhibitor; calved January 1, 1883, sire King of Central Fruit and Stock Farm, 304, dam Mertie by Napoleon, 58, gr. d. Nancy 2d by Sir Champion, 38.

MILCH COWS.

Milch Cows of any Breed.

Smiths & Powell, Syracuse, N. Y.; first prize, thirty dollars; Netherland Baroness (Holstein), black and white, bred by Jan van der Meer, Beemster, North Holland, calved March 15, 1877, sire District Bull, dam Gert Met 3d.

OXEN, STEERS AND FAT CATTLE.

Fat Oxen, over Four Years Old.

George Ayrault, Poughkeepsie, N. Y.; first prize, thirty dollars; red and white, four years.

M. B. Ritter, Waterloo, N. Y.; second prize, fifteen dollars; red and white, bred by exhibitor; calved March 20, 1879, sire Prince of the River, 12,677 (Shorthorn), dam three-fourths shorthorn.

Fat Steers, under Four Years Old.

George Ayrault, Jr., Poughkeepsie, N. Y.; first prize, thirty dollars; red and white, three years old.

George Ayrault, Poughkeepsie, N. Y.; second prize, fifteen dollars; roan, three years.

Fat Cows, over Four Years Old.

Erastus Corning, Albany, N. Y.; first prize, thirty dollars; Topsy Turvey (Hereford), red with white face, bred by exhibitor; calved March 13, 1877, sire Comus (4457), dam Topsy by Taurus, gr. d. Marchioness 2d by Major.

George Ayrault, Jr., Poughkeepsie, N. Y.; second prize, fifteen dollars; red and white, four years.

Fat Heifers, under Four Years Old.

George Ayrault, Poughkeepsie, N. Y.; first prize, thirty dollars; red and white, three years.

W. C. Albertson, North Rush, N. Y.; second prize, fifteen dollars; (Shorthorn) red and white, bred by exhibitor; calved October 7, 1879, sire Geneva Duke, 11209, dam Buttercup 3d by Virgil, 9271, gr. d. Buttercup 2d by Victor, 11104.

HORSES.

BREEDING AND GROWING STOCK.

Special Prize for the Best Draught or Agricultural Stallion, of any Age or Breed.

Christian Sitterly, Palatine, N. Y.; special prize, one hundred dollars; MacHenry, dark bay, 16.2, seven years, bred by exhibitor; sire Clyde, dam Dolly by Boshart's Messenger, gr. d. by Rysdyk's Hambletonian.

CLYDESDALES AND THEIR CROSSES.

Stallions, over Four Years Old.

Christian Sitterly, Palatine, N. Y.; first prize, fifty dollars; MacHenry, dark bay, 16.2, seven years, bred by exhibitor; sire Clyde, dam Dolly by Boshart's Messenger, gr. d. by Rysdyk's Hambletonian.

Orrin W. Todd, Greece, N. Y.; second prize, twenty-five dollars; Young Marquis 2d, chestnut, 16.2, eight years, sire Young Marquis, dam by Masterman, gr. d. by Jack's Alive.

Stallions, Three Years Old.

Smiths & Powell, Syracuse, N. Y.; first prize, forty dollars; Sir Robert, dark bay, sire Sir Robert, 17 (1520), dam Fairfield Nelly.

Stallions, Two Years Old.

John Bennett, North Parma, N. Y.; first prize, thirty dollars; Lord Stanley 2d, bay, 15.2, foaled August 31, 1881, bred by Powell Bros., Springboro, Penn.; sire Lord Stanley, dam Edna by Joe the Banker, gr. d. by A One.

Smiths & Powell, Syracuse, N. Y.; second prize, fifteen dollars; Colossus, bay; sire Lochnager, 753 (1469), dam Bess by Young Marquis, 293, gr. d. by Hard Fortune.

Mares, over Four Years Old.

Smiths & Powell, Syracuse, N. Y.; first prize, fifty dollars; Jean, bay, six years; sire Scottish Lad, 846, dam by Tintock, gr. d. by Admiral, 4.

Leyman S. Wansey, Spencerport, N. Y.; second prize, twenty-five dollars; Mary McNall, bay, 16, seven years, bred by Washington McNall, Port Hope, Canada; sire Young Canada, dam by imported Comet.

Fillies, Three Years Old.

Smiths & Powell, Syracuse, N. Y.; first prize, forty dollars; Fanny Taylor, bay; sire Highland Chief, 226 (382), dam by Drayman, gr. d. by Hard Fortune.

Fillies, Two Years Old.

Smiths & Powell, Syracuse, N. Y.; first prize, thirty dollars; Nell Laurie, bay; sire Young Broomfield, 73, dam by Sir William Wallace, gr. d. by London Tom.

Hiram Babcock, Auburn, N. Y.; second prize, fifteen dollars; Lady Belle, gray; sire Duke of Homer (Percheron), dam by Scotland's Glory (Clydesdale).

Fillies, One Year Old.

Smiths & Powell, Syracuse, N. Y.; first prize, twenty dollars; Jessamine, light bay; sire The Brown Glancer, 222 (1322), dam Black Madam.

. P. Whitney, Orleans, N. Y.; second prize, ten dollars; Beaute, dark bay, bred by exhibitor; sire Defiance, dam Flora by Prince of Wales, imported.

PERCHERONS AND THEIR CROSSES.

Stallions, over Four Years Old.

Howard G. White, Syracuse, N. Y.; first prize, fifty dollars; Raspail, gray, 17.1, eight years, bred by P. Sagoy, Nogent-le-Rotrou, France, imported by exhibitor; sire Pierrot, dam Couronne.

Houghton Farm, Mountainville, N. Y.; second prize, twenty-five dollars; Bayard, dapple gray, 17.2, five years, imported in August, 1881.

Stallions, Three Years Old.

Henry Tubbs, Osceola, Penn.; first prize, forty dollars; Dandy, dark gray, 16. 2.

. Billings, East Kendall, N. Y.; second prize, twenty dollars; Ravenna, black, 16.1.

Stallions, Two Years Old.

. A. Cottrell, Andover, N. Y.; first prize, thirty dollars; Phillisides, dark gray, 15.2, bred by M. Perriott, Nogent-le-Rotrou, France, sire Narbonne.

George H. Wescott, Savannah, N. Y.; second prize, fifteen dollars; Coco, dark gray, 16, bred by James Early, Savannah, N. Y.; sire Coco, imported by M. W. Dunham, Wayne, Ill., dam by Louis Napoleon.

Stallions, One Year Old.

Owen Baker, Belmont, N. Y.; first prize, twenty dollars; Frank, bay; sire Cottrell's Napier.

Henry Tubbs, Osceola, Penn.; second prize, ten dollars; gray; sire Valient.

Mares, over Four Years Old.

Howard G. White, Syracuse N. Y.; first prize, fifty dollars; Rustique, gray, 16.2, six years, bred by H. Guibert, Nogent-le-Rotrou, France, imported by exhibitor; sire Margot, dam Rustique.

John W. Akin, Scipio, N. Y.; second prize, twenty-five dollars; Molly, gray, 16, five years, imported by exhibitor in August, 1883.

Fillies, Three Years Old.

John W. Akin, Scipio, N. Y.; first prize, forty dollars; Fanny R., dark gray, 16.2.

Fillies, Two Years Old.

F. B. Redfield, Batavia, N. Y.; first prize, thirty dollars; Nathalie, dark gray, imported by M. W. Dunham, Wayne, Ill.

John W. Akin, Scipio, N. Y.; second prize, fifteen dollars; Jennie, gray, 15.3; sire Akin's Duke of Homer, dam by Norman Leslie, gr. d. by Louis Philippe.

Fillies, One Year Old.

Thomas Burns, Pittsford, N. Y.; first prize, twenty dollars; Perchy, bay, bred by exhibitor; foaled May 17, 1882, sire Grenadier.

E. A. Cottrell, Andover, N. Y.; second prize, ten dollars; Mollie, bay; sire Napier, dam by Young Ethan Allen, gr. d. by Bay Norman.

THOROUGHBREDS AND THEIR CROSSES.

Including Messengers of all Branches, Clays, Morgans, Coachers and all Families Founded upon, or more or less Improved by, English or Eastern Blood.

Special Prize for the Best Stallion of any Age.

C. J. Hamlin, Willink, N. Y.; special prize, one hundred and fifty dollars; Mambrino King, chestnut, 15.3, 11 years; sire Mambrino Patchen, dam by Alexander's Edwin Forest, gr. d. by Duroc, gr. gr. d. by imported Messenger.

Stallions, over Five Years Old.

C. J. Hamlin, Willink, N. Y.; first prize, seventy dollars; Mambrino King, chestnut, 15.3, 11 years; sire Mambrino Patchen, dam by Alexander's Edwin Forrest, gr. d. by Duroc, gr. gr. d. by imported Messenger.

N. B. Mann, Mannsville, N. Y.; second prize, thirty-five dollars; William Rysdyk, bay, 15.3, 7 years, bred by Captain Tyler, Oswego, N. Y.; sire David Bonner, dam Babe by Tippoo.

Stallions, Four Years Old.

N. P. Pond, Rochester, N. Y.; first prize, sixty dollars; Thornwood bay, 15.3, bred by H. M. Bugher, Woodland Farm, Glendale, Ohio; sire Woodlawn by Hero of Thorndale, dam Maggie Strader, by Mambrino Clay, gr. d. Susan Loder by Daniel Boone.

Henry Pulis, West Greece, N. Y.; second prize, thirty dollars; Sunrise, bay, 16.1, bred by J. D. Worden, North Parma, N. Y.; foaled, June 24, 1879, sire Monroe Chief, dam by Black Hawk (Gardner's).

Stallions, Three Years Old.

Nathan Case, Egypt, N. Y.; first prize, fifty dollars; Young Tremont, bay, 16. 2, bred by exhibitor; sire Little's Tremont by Alexander's Belmont, dam by Bay Eclipse, gr. d. by Henry, gr. gr. d. by Abuluca.

Elijah Lake, Ira, N. Y.; second prize, twenty-five dollars; bay, 15.

Stallions, Two Years Old.

C. J. Hamlin, Willink, N. Y.; first prize, forty dollars; Blaine, bay, 14.3; sire Almont, Jr., dam by Hamlin's Patchen, gr. d. by Dictator.

F. B. Redfield, Batavia, N. Y.; second prize, twenty dollars; Decebalus, brown or bay, bred by exhibitor; sire Harold, dam Dacia by Woodford Mambrino, gr. d. Dahlia by Pilot, Jr., gr. gr. d. Madam Dudley.

Stallions, One Year Old.

Smiths & Powell, Syracuse N. Y.; first prize, thirty dollars; Autocrat bay; sire Havoc, dam Onondaga Girl by Reveler, gr. d. Lou by Centreville.

C. J. Hamlin, Willink, N. Y.; second prize, fifteen dollars; W. H. Nichols; sire Blackwood Chief, dam by Mambrino Patchen, gr. d. by Tom Crowder.

Mares, over Five Years Old.

C. J. Hamlin, Willink, N. Y.; first prize, sixty dollars; chestnut, 16, five years.

Charles Coolidge, Phelps, N. Y.; second prize, thirty dollars; brown, 16.2, five years.

Fillies, Four Years Old.

C. J. Hamlin, Willink, N. Y.; first prize, fifty dollars; Belle H., dark bay, 15.2½; sire Almont, Jr., dam by Hamlin's Patchen, gr. d. by a son of Hill's Black Hawk.

Fitch & Jewett, West Farmington, N. Y.; second prize, twenty-five dollars; Gazelle, black, 15.2, bred by Smiths & Powell, Syracuse, N. Y.; sire Reveller, dam Eva by Satellite, gr. d. Clark mare by a son of Consternation.

Fillies, Three Years Old.

Will Andrews, Batavia, N. Y.; first prize, forty dollars; Mollie G., bay, foaled June 6, 1880; sire Blue Danube, dam by Jim Lewis (son of Van De Bogart's Henry Clay), gr. d. by Young Moscow (son of Mazeppa).

C. J. Hamlin, Willink, N. Y.; second prize, twenty dollars; bay, 15.2½; sire Almont, Jr., dam by Hamlin's Patchen, gr. d. by Rysdyk's Hambletonian.

Fillies, Two Years Old.

C. J. Hamlin, Willink, N. Y.; first prize, thirty dollars; Bessie H., bay, 15; sire Almont, Jr., dam by Mambrino Patchen, gr. d. by Tom Crowder.

S. C. Wells, Le Roy, N. Y.; second prize, fifteen dollars; Maud Gothard, bay, bred by exhibitor; sire St. Gothard, dam Ingelow by Rolla, gr. d. Mineola by Edward Everett.

Fillies, One Year Old.

C. J. Hamlin, Willink, N. Y.; first prize, twenty dollars; Silk, bay; sire Alkantara (son of George Wilkes), dam Gerty Smith by Mambrino Patchen, gr. d. Dora by Lancaster (son of Glencoe).

Isaac S. Wells, Egypt, N. Y.; second prize, ten dollars; Halcie B., bay, bred by exhibitor; sire Burlew's Charlie B., dam Morgan Queen.

SHETLAND PONIES.

Stallions, over Two Years Old.

J. F. Converse, Woodville, N. Y.; first prize, twenty dollars; Dexter, black, 10, ten years.

Stallions, under Two Years Old.

J. F. Converse, Woodville, N. Y.; first prize, twenty dollars; Fearless, black, 9.2, eighteen months.

Mares, over Two Years Old.

J. F. Converse, Woodville, N. Y.; first prize, twenty dollars; Lulu, black, 10, six years.

HARNESS AND SADDLE HORSES.

Draught Pairs.

C. Eberenz, Wellsboro, Penn.; first prize, fifty dollars; bay, 16, three and four years; sire Valiant, dam Molly.

Isaac C. Otis, Jordan, N. Y.; second prize, twenty-five dollars; dapple gray, 16.2, seven and eight years.

Coach Pairs.

James B. Shearer, Pittsford, N. Y.; first prize, fifty dollars; dark bay, 16.1, five years.

A. M. Parker, Trenton, N. Y.; second prize, twenty-five dollars; brown geldings, 15.3½, six years.

Phæton Pairs.

Peter Sanderson, Rochester, N. Y.; first prize, fifty dollars; bay geldings, 15.3, five and six years.

R. P. Hubbard, Chili, N. Y.; second prize, twenty-five dollars; black fillies, 15.1, three years; sire Montgomery Royal George.

Coupé Horses.

A. W. Smith, Cuba, N. Y.; first prize, thirty dollars; Paul, brown gelding, 16.2, bred by exhibitor; foaled June 15, 1878, sire Gibson, dam by Wood's Hambletonian.

Thomas Leighton, Rochester, N. Y.; second prize, fifteen dollars; chestnut gelding, six years.

Roadsters.

Wolcott Van De Bogart, Batavia, N. Y.; first prize, thirty dollars; Ray Dahna, bay; sire Blue Danube, dam by Ray Miller, gr. d. by Bay Hambletonian.

Ensign & Brown, Jeddo, N. Y.; second prize, fifteen dollars; bay mare, 15, seven years.

Saddle Horses.

A. W. Smith, Cuba, N. Y.; first prize, thirty dollars, Jeff Davis, brown gelding, 15, bred by exhibitor; foaled May 21, 1877, sire Jeff Davis, dam by Wood's Hambletonian.

Peter Sanderson, Rochester, N. Y.; second prize, fifteen dollars; bay, 15.2, five years.

Ponies (under 13 hands) Broken to Harness or Saddle.

H. R. Nettleton, Rochester, N. Y.; first prize, twenty dollars; bay and white spotted, 13, eight years.

W. C. Albertson, North Rush, N. Y.; second prize, ten dollars; Modoc, chestnut, 13, seven years.

JACKS AND MULES.

JACKS.

H. Burnett, Logan, N. Y.; first prize, thirty dollars; Don Juan, dark brown, 14, seven years.

John Wellman, Parma, N. Y.; second prize, fifteen dollars; grayish brown, 13.2, ten years.

SHEEP, SWINE AND POULTRY.

LONG WOOLED SHEEP — LEICESTERS.

Rams, over Two Years Old.

William S. Moore, Mt. Upton, N. Y.; first prize, twenty dollars; bred by John Clark.

D. C. Kurtz, Pittsford, N. Y.; second prize, ten dollars.

Rams, One Year Old.

George H. Middleton, West Webster, N. Y.; first prize, twenty dollars; bred by exhibitor.

W. S. Moore, Mt. Upton, N. Y.; second prize, ten dollars; bred by exhibitor.

Ram Lambs.

D. C. Kurtz, Pittsford, N. Y.; first prize, ten dollars.

Geo. H. Middleton, West Webster, N. Y.; second prize, five dollars.

Pens of Ewes over Two Years Old.

Geo. H. Middleton, West Webster, N. Y.; first prize, twenty dollars.

D. C. Kurtz, Pittsford, N. Y.; second prize, ten dollars.

Pens of Yearling Ewes.

D. C. Kurtz, Pittsford, N. Y.; first prize, twenty dollars.

George H. Middleton, West Webster, N. Y.; second prize, ten dollars.

Pens of Ewe Lambs.

George H. Middleton, West Webster, N. Y.; first prize, ten dollars.

COTSWOLDS.

Rams, over Two Years Old.

George Chick, Attica, N. Y.; first prize, twenty dollars; bred by James Russell.

George Ingersoll, Charleston, N. Y.; second prize, ten dollars; imported.

Rams, One Year Old.

George Ingersoll, Charleston, N. Y.; first prize, twenty dollars; bred by exhibitor.

Peter D. Hulst, East Penfield, N. Y.; second prize, ten dollars; bred by James Russell, Canada.

Ram Lambs.

Aaron Bordwell, Corfu, N. Y.; first prize, ten dollars; Dido, bred by exhibitor.

George Chick, Attica, N. Y.; second prize, five dollars; bred by exhibitor.

Pens of Ewes over Two Years Old.

George Ingersoll, Charleston, N. Y.; first prize, twenty dollars; bred by exhibitor.

George Chick, Attica, N. Y.; second prize, ten dollars; bred by James Russell.

Pens of Yearling Ewes.

Shepard & Peer, Mt. Morris, N. Y.; first prize, twenty dollars; bred by John Gillett, England.

George Ingersoll, Charleston, N. Y.; second prize, ten dollars; bred by exhibitor.

Pens of Ewe Lambs.

Shepard & Peer, Mt. Morris, N. Y.; first prize, ten dollars; bred by F. S. Peer, East Palymra, N. Y.

Aaron Bordwell, Corfu, N. Y.; second prize, five dollars; bred by exhibitor.

LINCOLNS.

Rams, over Two Years Old.

G. W. & O. Johnson, Geneva, N. Y.; first prize, twenty dollars; bred by exhibitors.

Rams, One Year Old.

G. W. & O. Johnson, Geneva, N. Y.; first prize, twenty dollars; bred by exhibitors.

Ram Lambs.

G. W. & O. Johnson, Geneva, N. Y.; first prize, ten dollars; bred by exhibitors.

Pens of Ewes Two Years Old.

G. W. & O. Johnson, Geneva, N. Y.; first prize, twenty dollars; bred by Geary & Bro.

Pens of Yearling Ewes.

G. W. & O. Johnson, Geneva, N. Y.; first prize, twenty dollars; bred by Geary & Bro.

Pens of Ewe Lambs.

G. W. & O. Johnson, Geneva, N. Y.; first prize, ten dollars; bred by exhibitors.

MIDDLE-WOOLED SHEEP — SOUTHDOWNS

Rams, over Two Years Old.

John Hobart Warren, Hoosick Falls, N. Y.; first prize, twenty dollars; bred by Lord Walsingham, England.

John Hobart Warren, Hoosick Falls, N. Y.; second prize, ten dollars; bred by exhibitor.

Rams, One Year Old.

Daniel B. Haight, Dover Plains, N. Y.; first prize, twenty dollars; bred by Lord Walsingham, England.

John Hobart Warren, Hoosick Falls, N. Y.; second prize, ten dollars; bred by exhibitor.

Ram Lambs.

Daniel B. Haight, Dover Plains, N. Y.; first prize, ten dollars; bred by exhibitor.

George H. Bell, Rome, N. Y.; second prize, five dollars; bred by exhibitor.

Pens of Ewes, over Two Years Old.

Daniel B. Haight, Dover Plains, N. Y.; first prize, twenty dollars, bred by exhibitor.

John Hobart Warren, Hoosick Falls, N. Y.; second prize, ten dollars, bred by exhibitor.

Pens of Yearling Ewes.

Daniel B. Haight, Dover Plains, N. Y.; first prize, twenty dollars; bred by Lord Walsingham, England.

John Hobart Warren, Hoosick Falls, N. Y.; second prize, ten dollars; bred by exhibitor.

Pens of Ewe Lambs.

Daniel B. Haight, Dover Plains, N. Y.; first prize, ten dollars; bred by exhibitor.

John Hobart Warren, Hoosick Falls, N. Y.; second prize, five dollars; bred by exhibitor.

SHROPSHIRES.

Rams, over Two Years Old.

George Ingersoll, Charleston, N. Y.; first prize, twenty dollars; imported.

C. D. Smead, Logan, N. Y.; second prize, ten dollars; Royal Gem, bred by Sir H. Alsopp, sire Baron Penderford.

Ram Lambs.

George Ingersoll, Charleston, N. Y.; first prize, ten dollars.

C. D. Smead, Logan, N. Y.; second prize, five dollars; Model, bred by exhibitor, sire Caractacus.

Pens of Ewes over Two Years Old.

C. D. Smead, Logan, N. Y.; first prize, twenty dollars; Lady Clermont, bred by Wm. M. Miller, Ontario, Can.; Fashion, bred by Richard Thomas. Barchurch, England; Beauty, bred by Mr. Lovett, Low Hill, England.

George Ingersoll, Charleston, N. Y.; second prize, ten dollars, imported.

Pens of Yearling Ewes.

George Ingersoll, Charleston, N. Y.; first prize, twenty dollars; imported.

C. D. Smead, Logan, N. Y.; second prize, ten dollars; Maggie Miller, bred by Wm. M. Miller, Ontario; Orietta and Cora, bred by John Evans, Affington, England, sire Royal Taunton.

Pens of Ewe Lambs.

George Ingersoll, Charleston, N. Y.; first prize, ten dollars; bred by exhibitor.

HAMPSHIRES.

Rams, over Two Years Old.

Henry Metcalf, Canandaigua, N. Y.; first prize, twenty dollars; bred by exhibitor.

Henry Metcalf, Canandaigua, N Y.; second prize, ten dollars; bred by exhibitor.

Rams, One Year Old.

Henry Metcalf, Canandaigua, N. Y.; first prize, twenty dollars; bred by exhibitor.

E. M. Benham, Hopewell Centre, N. Y.; second prize, ten dollars.

Ram Lambs.

E. M. Benham, Hopewell Centre, N. Y.; first prize, ten dollars.

Henry Metcalf, Canandaigua, N. Y.; second prize, five dollars; bred by exhibitor.

Pens of Ewes, over Two Years Old.

Henry Metcalf, Canandaigua, N. Y.; first prize, twenty dollars; bred by exhibitor.

E. M. Benham, Hopewell Centre, N. Y.; second prize, ten dollars.

Pens of Yearling Ewes.

Henry Metcalf, Canandaigua, N. Y.; first prize, twenty dollars; bred by exhibitor.

Pens of Ewe Lambs.

Henry Metcalf, Canandaigua, N. Y.; first prize, ten dollars.

Henry Metcalf, Canandaigua, N. Y.; second prize, five dollars.

OXFORDSHIRES.

Ram Lambs.

Aaron Bordwell, Corfu, N. Y.; first prize, ten dollars; Snowball, by J. C. Ross.

FINE WOOLED SHEEP — MERINOS BRED FOR FINENESS OF WOOL.

Rams, over Three Years Old.

C. D. and C. Kenyon, Centre White Creek, N. Y.; first prize, twenty dollars; bred by Carl Heyne.

Rams, One Year Old.

Warren J. Tyler and Son, South Byron, N. Y.; first prize, twenty dollars.

M. F. Gibbs, Livonia, N. Y.; second prize, ten dollars; bred by E. L. Gage.

Ram Lambs.

C. D. and C. Kenyon, Centre White Creek, N. Y.; first prize, ten dollars.

Warren J. Tyler & Son, South Byron, N. Y.; second prize, five dollars.

Pens of Ewes over Three Years Old.

C. D. and C. Kenyon, Centre White Creek, N. Y.; first prize, twenty dollars; bred by Carl Heyne.

Warren J. Tyler & Son, South Byron, N. Y.; second prize, ten dollars.

Pens of Ewes Two Years Old.

Warren J. Tyler & Son, South Byron, N. Y.; first prize, twenty dollars.

C. D. and C. Kenyon, Centre White Creek, N. Y.; second prize, ten dollars; bred by Carl Heyne.

Pens of Yearling Ewes.

D. W. Percy, North Hoosick, N. Y.; first prize, twenty dollars; bred by exhibitor.

Warren J. Tyler & Son, South Byron, N. Y.; second prize, ten dollars.

Pens of Ewe Lambs.

Warren J. Tyler & Son, South Byron, N. Y.; first prize, ten dollars.

C. D. and C. Kenyon, Centre White Creek, N. Y.; second prize, five dollars; bred by exhibitors.

MERINOS BRED FOR WEIGHT OF FLEECE.

Rams, over Three Years Old.

Ray Bros., Honeoye, N. Y.; first prize, twenty dollars.

John S. Beecher, Livonia, N. Y.; second prize, ten dollars; Ruby's Boy, bred by John S. Beecher.

Rams, Two Years Old.

Galusha & Burgess, North Hoosick, N. Y.; first prize, twenty dollars; Barnum, bred by D. B. Galusha.

Ray Bros., Honeoye, N. Y.; second prize, ten dollars.

Rams, One Year Old.

Beecher & Bennett, Livonia, N. Y.; first prize, twenty dollars; Eldorado, bred by F. D. Barton, Vergennes, Vt.

John S. Beecher, Livonia, N. Y.; second prize, ten dollars; bred by exhibitor.

Ram Lambs.

Ray Bros., Honeoye, N. Y.; first prize, ten dollars.

Sylvester B. James, Hoosick, N. Y.; second prize, five dollars; bred by exhibitor.

Pens of Ewes over Three Years Old.

Ray Bros., Honeoye, N. Y.; first prize, twenty dollars.

C. D. and C. Kenyon, Centre White Creek, N. Y.; second prize, ten dollars; bred by exhibitors.

Pens of Ewes, Two Years Old.

Ray Bros., Honeoye, N. Y.; first prize, twenty dollars.

John S. Beecher, Livonia, N. Y.; second prize, ten dollars; bred by exhibitor.

Pens of Yearling Ewes.

Ray Bros., Honeoye, N. Y.; first prize, twenty dollars.

P. & G. F. Martin, Rush, N. Y.; second prize, ten dollars.

Pens of Ewe Lambs.

Ray Bros., Honeoye, N. Y.; first prize, ten dollars.

Sylvester B. James, Hoosick, N. Y.; second prize, five dollars; bred by exhibitor.

MERINOS BRED FOR LENGTH OF STAPLE.

Rams, over Three Years Old.

Howard Tryon, Fleming, N. Y.; first prize, twenty dollars; bred by L. P. Clark.

W. S. Moore, Mount Upton, N. Y.; second prize, ten dollars; bred by H. O. Moore.

Rams, Two Years Old.

C. D. & C. Kenyon, Center White Creek, N. Y.; first prize, twenty dollars; bred by exhibitors.

Rams, One Year Old.

M. F. Gibbs, Livonia, N. Y.; first prize, twenty dollars; bred by E. L. Gage.

Warren J. Tyler & Son, South Byron, N. Y.; second prize, ten dollars.

Ram Lambs.

John S. Beecher, Livonia, N. Y.; first prize, ten dollars.

Warren J. Tyler & Son, South Byron, N. Y.; second prize, five dollars.

Pens of Ewes, over Three Years Old.

Warren J. Tyler & Son, South Byron, N. Y.; first prize, twenty dollars.

W. S. Moore, Mount Upton, N. Y.; second prize, ten dollars; bred by H. O. Moore.

Pens of Ewes, Two Years Old.

Charles H. Richmond, Livonia Station, N. Y.; first prize, twenty dollars; bred by E. L. Gage.

Roscoe C. James, Eagle Bridge, N. Y.; second prize, ten dollars; bred by J. L. Quackenbush.

Pens of Yearling Ewes.

Charles H. Richmond, Livonia Station, N. Y.; first prize, twenty dollars; bred by E. L. Gage.

Pierce & Fellows, Spencerport, N. Y.; second prize, ten dollars; bred by exhibitors.

Pens of Ewe Lambs.

Roscoe C. James, Eagle Bridge, N. Y.; first prize, ten dollars; bred by exhibitor.

Sylvester B. James, Hoosick, N. Y.; second prize, five dollars; bred by exhibitor.

SWINE.

LARGE WHITE BREEDS.

Herd Prize.

. J. Clark, Belleville, N. Y.; gold medal.

Boars, over One Year Old.

. J. Clark, Belleville, N. Y.; first prize, twenty dollars.
. H. Britt, Ridgeway, N. Y.; second prize, ten dollars, Orleans.

Boars, under One Year Old.

R. Proctor, Utica, N. Y.; first prize, twenty dollars; Cheshire King, bred by exhibitor.
J. Clark, Belleville, N. Y.; second prize, ten dollars.

Sows, over One Year Old.

R. Proctor, Utica, N. Y.; first prize, twenty dollars; Lady Cheshire, bred by J. C. Eldred, Newport, N. Y.
J. Clark, Belleville, N. Y.; second prize, ten dollars.

Sows, under One Year Old.

L. Thomas, Cuba, N. Y.; first prize, twenty dollars, bred by exhibitor.
homas Brothers, Franklinville, N. Y.; second prize, ten dollars.

POLAND-CHINA.

Herd Prize.

eorge H. Bell, Rome, N. Y.; gold medal; boar, Roman Chief; sows, Bell's Favorite, Little Queen, Queen of Rome 2d.

Boars, over One Year Old.

eorge H. Bell, Rome, N. Y.; first prize, twenty dollars; Roman Chief, bred by exhibitor.
vid Smith, Rome, N. Y.; second prize, ten dollars; Warwick, bred by exhibitor; sire Royal George, dam Maggie.

Boars, under Year Old.

eorge A. Bell, Rome, N. Y.; first prize, twenty dollars; Major B., bred by exhibitor.
vid Smith, Rome, N. Y.; second prize, ten dollars; Duke, bred by exhibitor; sire Royal George, dam Maggie.

Sows, over One Year Old.

George H. Bell, Rome, N. Y.; first prize, twenty dollars; Little Queen, bred by exhibitor.

John Bell, Lowell, N. Y.; second prize, ten dollars; Maid of Lowell, bred by G. H. Bell, Rome, N. Y.

Sows, under One Year Old.

George H. Bell, Rome, N. Y.; first prize, twenty dollars; Handsome, bred by exhibitor.

John Bell, Lowell, N. Y.; second prize, ten dollars; Queen of Oneida, bred by exhibitor.

DUROC JERSEY.

Herd Prize.

Oscar J. Lewis, Schodack Centre, N. Y.; gold medal.

Boars, under One Year Old.

O. Howland & Son, Auburn, N. Y.; first prize, twenty dollars.

Oscar J. Lewis, Schodack Centre, N. Y.; second prize, ten dollars; bred by exhibitor.

Sows, over One Year Old.

Oscar J. Lewis, Schodack Centre, N. Y.; first prize, twenty dollars; bred by exhibitor.

Daniel C. Munro, Elbridge, N. Y.; second prize, ten dollars.

Sows, under One Year Old.

Oscar J. Lewis, Schodack Centre, N. Y.; first prize, twenty dollars; bred by exhibitor.

Ensign & Brown, Jeddo, N. Y.; second prize, ten dollars.

SMALL WHITE BREEDS.

Herd Prize.

T. R. Proctor, Utica, N. Y.; gold medal.

Boars, over One Year Old.

T. R. Proctor, Utica, N. Y.; first prize, twenty dollars; Lord Rinaldo, bred by exhibitor; sire Rinaldo, dam Marchioness by King John, imported.

S. Donnan & Son, York, N. Y.; second prize, ten dollars; Young Prince, bred by Ensign & Brown, Jeddo, N. Y.; farrowed November 28, 1881, sire Duke of Yorkshire, dam Queen Bess V by King John V.

Boars, under One Year Old.

Ensign & Brown, Jeddo, N. Y.; first prize, twenty dollars.

A. G. Chriswell, Adams' Basin, N. Y.; second prize, ten dollars; Ivanhoe, eight months, bred by exhibitor.

Sows, over One Year Old.

T. R. Proctor, Utica, N. Y.; first prize, twenty dollars; Queen III, bred by H. H. Ingersoll, Owego, N. Y.; sire King John III, dam Queen by Duke of Yorkshire, imported.

Ensign & Brown, Jeddo, N. Y.; second prize, ten dollars.

Sows, under One Year Old.

T. R. Proctor, Utica, N. Y.; first prize, twenty dollars; Queen of Oneida, bred by exhibitor; sire Lord John, dam Queen III by King John.

A. G. Chriswell, Adams' Basin, N. Y.; second prize, ten dollars; Empress, eight months, bred by exhibitor.

BERKSHIRES.

Herd Prize.

T. R. Proctor, Utica, N. Y.; gold medal.

Boars, over One Year Old.

A. G. Barlow & Co., North Ridgeway, N. Y.; first prize, twenty dollars; Tom Hood V, bred by exhibitor; farrowed October 6, 1881, sire Tom Hood, dam Sallie Hillside.

A. G. Barlow & Co., North Ridgeway, N. Y.; second prize, ten dollars; Tom Hood, bred by A. M. Fulford, Belair, Md.; farrowed October 5, 1880, sire Robin Hood 3d, dam Pet.

Boars, under One Year Old.

T. R. Proctor, Utica, N. Y.; first prize, twenty dollars; Viceroy of Canada, bred by John Snell's Sons, Edmonton, Canada; sire Royal Stewart, dam Sallie Oxford (imported) by Oxford.

T. R. Proctor, Utica, N. Y.; second prize, ten dollars; Gipsy Pearl, bred by exhibitor; sire Emperor III, dam Proctor's Black Pearl by Oxford Reserve.

Sows, over One Year Old.

T. R. Proctor, Utica, N. Y.; first prize, twenty dollars; Queen of Utica, bred by John Snell's Sons, Edmonton, Canada; sire Royal Hope (imported), dam Cantata by Robin Hood.

T. R. Proctor, Utica, N. Y.; second prize, ten dollars; Lucille Western, bred by exhibitor; sire Proctor's Castor (imported), dam Western Belle II (imported) by Royal Carlisle.

Sows, under One Year Old.

T. R. Proctor, Utica, N. Y.; first prize, twenty dollars; Proctor's Lady Maybreeze, bred by exhibitor; sire Royal Derby, dam Proctor's Lady Oxford by Oxford Reserve (imported).

T. R. Proctor, Utica, N. Y.; second prize, ten dollars; Proctor's Lady Reserve, bred by exhibitor; sir Royal Derby (imported), dam Proctor's Lady Oxford by Oxford Reserve (imported).

ESSEX.

Boars, over One Year Old.

J. S. Woodward, Lockport, N. Y.; first prize, twenty dollars.

Sows, over One Year Old.

J. S. Woodward, Lockport, N. Y.; first prize, twenty dollars.

Sows, under One Year Old.

J. S. Woodward, Lockport, N. Y.; first prize, twenty dollars.

POULTRY.

ASIATIC.

Light Brahmas.

L. J. Bundy, Ontario, N. Y.; first prize, five dollars.

L. J. Bundy, Ontario, N. Y.; second prize, three dollars.

Dark Brahmas.

L. J. Bundy, Ontario, N. Y.; first prize, five dollars.

E. A. Wendell, Albany, N. Y.; second prize, three dollars.

Buff, Lemon or Cinnamon Cochins.

L. J. Bundy, Ontario, N. Y.; first prize, five dollars.

L. J. Bundy, Ontario, N. Y.; second prize, three dollars.

Partridge or Grouse Cochins.

H. A. Jones, Worcester, Mass.; first prize five dollars; bred by S. L. Booth.

L. J. Bundy, Ontario, N. Y.; second prize, three dollars.

White Cochins.

C. L. G. Blessing, Slingerlands, N. Y.; first prize, five dollars.
C. L. G. Blessing, Slingerlands, N. Y.; second prize, three dollars.

Black Cochins.

L. J. Bundy, Ontario, N. Y.; first prize, five dollars.
L. J. Bundy, Ontario, N. Y.; second prize, three dollars.

Langshans.

Roscoe C. James, Eagle Bridge, N. Y.; first prize, five dollars.

DORKINGS.

Colored Dorkings.

H. A. Jones, Worcester, Mass.; first prize, five dollars.
James Evans, Macedon, N. Y,; second prize, three dollars.

Silver Gray Dorkings.

E. A. Wendell, Albany, N. Y.; first prize, five dollars.

White Dorkings.

J. V. Underwood, East Scott, N. Y.; first prize, five dollars.

AMERICAN.

Dominiques.

Jones Wilcox, East Chatham, N. Y.; first prize, five dollars.
Jones Wilcox, East Chatham, N. Y.; second prize, three dollars.

Plymouth Rocks.

L. D. Ely, Rochester, N. Y.; first prize, five dollars.
L. J. Bundy, Ontario, N. Y.; second prize, three dollars.

Wyandottes.

Jones Wilcox, East Chatham, N. Y.; first prize, five dollars.
O. Howland & Son, Auburn, N. Y.; second prize, three dollars.

HAMBURGHS.

Golden Spangled.

O. Howland & Son, Auburn, N. Y.; first prize, five dollars.
O. Howland & Son, Auburn, N. Y.; second prize, three dollars.

Silver Spangled.

Jones Wilcox, East Chatham, N. Y.; first prize, five dollars.
Jones Wilcox, East Chatham, N. Y.; second prize, three dollars.

Golden Penciled.

O. Howland & Son, Auburn, N. Y.; second prize, three dollars.

Silver Penciled.

J. V. Underwood, East Scott, N. Y.; first prize, five dollars.
W. H. Underwood, East Scott, N. Y.; second prize, three dollars.

Black.

E. A. Wendell, Albany, N. Y.; first prize, five dollars.
Jones Wilcox, East Chatham, N. Y.; second prize, three dollars.

SPANISH.

Black Spanish.

O. Howland & Son, Auburn, N. Y.; first prize, five dollars.

White Leghorns.

L. D. Ely, Rochester, N. Y.; first prize, five dollars.
L. D. Ely, Rochester, N. Y.; second prize, three dollars.

Brown Leghorns.

O. Howland & Son, Auburn, N. Y.; first prize, five dollars.
Jones Wilcox, East Chatham, N. Y.; second prize, three dollars.

Black Leghorns.

Nicholay & Greene, Newark, N. Y.; first prize, five dollars.

Dominique Leghorns.

Jones Wilcox, East Chatham, N. Y.; first prize, five dollars.
O. Howland & Son, Auburn, N. Y.; second prize, three dollars.

FRENCH.

Houdans.

John W. McHarg, Albany, N. Y.; first prize, five dollars.
John W. McHarg, Albany, N. Y.; second prize, three dollars.

POLISH.

Black Polish.

J. V. Underwood, East Scott, N. Y.; first prize, five dollars.

White Polish.

G. W. Bain, East Chatham, N. Y.; first prize, five dollars.
G. W. Bain, East Chatham, N. Y.; second prize, three dollars.

Golden Polish.

W. H. Underwood, East Scott, N. Y.; first prize, five dollars.
W. H. Underwood, East Scott, N. Y.; second prize, three dollars.

Silver Polish.

W. H. Underwood, East Scott, N. Y.; first prize, five dollars.
O. Howland & Son, Auburn, N. Y.; second prize, three dollars.

GAMES.

Black-breasted Red.

James Evans, Macedon, N. Y.; first prize, five dollars.
H. H. Malleson, Hudson, N. Y.; second prize, three dollars.

Silver Duckwing Game.

O. Howland & Son, Auburn, N. Y.; second prize, three dollars.

Yellow Duckwing Game.

E. A. Wendell, Albany, N. Y.; second prize, three dollars.

Other Approved Well-bred Games.

H. H. Malleson, Hudson, N. Y.; first prize, five dollars; ginger red.

BANTAMS.

Red Game.

T. C. Stanton, Rochester, N. Y.; first prize, five dollars.
Ensign & Brown, Jeddo, N. Y.; second prize, three dollars.

Red Pile Game.

H. A. Jones, Worcester, Mass.; first prize, five dollars.
H. A. Jones, Worcester, Mass.; second prize, three dollars.

Silver Duckwing Game.

C. L. G. Blessing, Slingerlands, N. Y.; first prize, five dollars.

Yellow Duckwing Game.

O. Howland & Son, Auburn, N. Y; first prize, five dollars.
T. C. Stanton, Rochester, N. Y.; second prize, three dollars.

Silver-laced Sebrights.

O. Howland & Son, Auburn, N. Y.; first prize, five dollars.
H. A. Jones, Worcester, Mass.; second prize, three dollars.

Gold-laced Sebrights.

Nathan S. Perkins, Fairport, N. Y.; first prize, five dollars.
Nathan S. Perkins, Fairport, N. Y.; second prize, three dollars.

Black.

C. L. G. Blessing, Slingerlands, N. Y.; first prize, five dollars.
T. C. Stanton, Rochester, N. Y.; second prize, three dollars; African.

Other Bantams.

H. A. Jones, Worcester, Mass.; first prize, five dollars; black game.
H. A. Jones, Worcester, Mass.; second prize, three dollars.

TURKEYS, ETC.

Bronze Turkeys.

George Ayrault, Jr., Poughkeepsie, N. Y.; first prize, five dollars.
George Ayrault, Poughkeepsie, N. Y.; second prize, three dollars.

White Turkeys.

O. Howland & Son, Auburn, N. Y.; first prize, five dollars.

Pearl Guinea Fowls.

H. A. Jones, Worcester, Mass.; first prize, three dollars; bred by C. J. Thompson.
O. Howland & Son, Auburn, N. Y.; second prize, two dollars.

White Guinea Fowls.

H. A. Jones, Worcester, Mass.; first prize, three dollars.
W. H. Underwood, East Scott, N. Y.; second prize, two dollars.

GEESE.

Embden.

George Ayrault, Jr., Poughkeepsie, N. Y.; first prize, five dollars.
George Ayrault, Poughkeepsie, N. Y.; second prize, three dollars.

White China.

John H. Webber, Big Flats, N. Y.; first prize, five dollars.
C. L. G. Blessing, Slingerlands, N. Y.; second prize, three dollars.

Brown China.

Jones Wilcox, East Chatham, N. Y.; first prize, five dollars.
C. L. G. Blessing, Slingerlands, N. Y.; second prize, three dollars.

Wild.

C. L. G. Blessing, Slingerlands, N. Y.; first prize, five dollars.
O. Howland & Son, Auburn, N. Y.; second prize, three dollars.

DUCKS.

Rouen.

O. Howland & Son, Auburn, N. Y.; first prize, five dollars.
Button Bros., Chittenango, N. Y.; second prize, three dollars.

Aylesbury.

J. V. Underwood, East Scott, N. Y.; second prize, three dollars.

Cayuga.

O. Howland & Son, Auburn, N. Y.; first prize, five dollars.
O. Howland & Son, Auburn, N. Y.; second prize, three dollars.

Muscovy.

W. H. Underwood, East Scott, N. Y.; first prize, five dollars.
C. L. G. Blessing, Slingerlands, N. Y.; second prize, three dollars.

Pekin.

O. Howland & Son, Auburn, N. Y.; first prize, five dollars.
O. Howland & Son, Auburn, N. Y.; second prize, three dollars.

PIGEONS.

Pouters.

C. L. G. Blessing, Slingerlands, N. Y.; first prize, three dollars.
H. E. Patterson, Rochester, N. Y.; second prize, two dollars; silver dun.

Carriers.

Oscar E. Upton, Rochester, N. Y.; first prize, three dollars.
George W. Martin, Rochester, N. Y.; second prize, two dollars.

Tumblers.

H. E. Patterson, Rochester, N. Y.; first prize, three dollars; almond.
Oscar E. Upton, Rochester, N. Y.; second prize, two dollars; yellow bald head.

Barbs.

Oscar E. Upton, Rochester, N. Y.; first prize, three dollars; white.
Oscar E. Upton, Rochester, N. Y.; second prize, two dollars; yellow.

Turbits, Solid Color.

H. A. Jones, Worcester, Mass.; first prize, three dollars; blue.
C. L. G. Blessing, Slingerlands, N. Y.; second prize, two dollars.

Turbits, Winged.

H. A. Jones, Worcester, Mass.; first prize, three dollars; silver winged.
H. A. Jones, Worcester, Mass.; second prize, two dollars; blue winged.

Owls, Solid Color.

H. A. Jones, Worcester, Mass.; first prize, three dollars.
C. L. G. Blessing, Slingerlands, N. Y.; second prize, two dollars.

Fantails.

Oscar E. Upton, Rochester, N. Y.; first prize, three dollars.
C. L. G. Blessing, Slingerlands, N. Y.; second prize, two dollars.

Jacobins.

Oscar E. Upton, Rochester, N. Y.; first prize, three dollars.
C. L. G. Blessing, Slingerlands, N. Y.; second prize, two dollars.

Blue Rocks.

C. L. G. Blessing, Slingerlands, N. Y.; first prize, three dollars.
H. E. Patterson, Rochester, N. Y.; second prize, two dollars.

Dragoons.

T. C. Stanton, Rochester, N. Y.; second prize, two dollars.

Antwerps.

T. C. Stanton, Rochester, N. Y.; first prize, three dollars; red checker.
T. C. Stanton, Rochester, N. Y.; second prize, two dollars; blue.

Collections of Pouters.

C. L. G. Blessing, Slingerlands, N. Y.; first prize, five dollars.

Collections of Carriers.

T. C. Stanton, Rochester, N. Y.; first prize, five dollars.

Collections of Tumblers.

Oscar E. Upton, Rochester, N. Y.; first prize, five dollars; bald head.
C. L. G. Blessing, Slingerlands, N. Y.; second prize, three dollars.

Collections of Fancy Pigeons.

Oscar E. Upton, Rochester, N. Y.; first prize, five dollars.
C. L. G. Blessing, Slingerlands, N. Y; second prize, three dollars.

Collections of Toy Pigeons.

Oscar E. Upton, Rochester, N. Y.; first prize, five dollars.
C. L. G. Blessing, Slingerlands, N. Y.; second prize, three dollars.

LOP-EARED OR MADAGASCAR RABBITS.

Bucks of any Color.

E. A. Wendell, Albany, N. Y.; first prize, three dollars.

Self-Colored Does.

Harry Yates, Rochester, N. Y.; first prize, three dollars.

Broken-Colored Bucks.

Harry Yates, Rochester, N. Y.; first prize, three dollars.

COMMON RABBITS.

Bucks.

William Merz, Rochester, N. Y.; first prize, two dollars.
William Merz, Rochester, N. Y.; second prize, one dollar.

Does.

William Merz, Rochester, N. Y.; first prize, two dollars.

IMPLEMENTS, MACHINERY, AND MANUFACTURED ARTICLES.*

2307. Kemp and Burpee Manufacturing Co., Syracuse, N. Y.; manure spreader, C. H. M.

2323. Robert Platman, Bellona, N. Y.; Platman's seed drill and fertilizer distributor, C. M.

2338. Wheeler & Melick Co., Albany, N. Y.; the Daniels plow sulky, C. H. M.

2349. J. A. Cross, Fultonville, N. Y.; conveyor and elevator for hay, grain, ensilage, etc., C. H. M.

2361. Eureka Mower Co., Towanda, Penn.; improved arrangement for lifting finger bar, C. M.

2397. Planters' Hoe Co., Troy, N. Y.; Herrington potato digger, C. H. M.

2399. W. G. Ricker, Rochester, N. Y.; Excelsior hay car and slings, C. M.

2421. American Grinding Mill Co., Chicago, Ill.; portable corn and feed mills, C. M.

2423. Bell City Manufacturing Co., Racine, Wis.; safety feed attachment to ensilage cutter, C. H. M.

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* The letters B. M. denote that a bronze medal was awarded; C. H. M., that the exhibitor is entitled to a certificate of highest merit; C. M., that the exhibitor is entitled to a certificate of merit. The numbers preceding the name are the catalogue numbers.

2426. Boomer & Boschert Press Co., Syracuse, N. Y.; apple grater, C. H. M.

2428. Boomer & Boschert Press Co., Syracuse, N. Y.; knuckle-joint cider press, C. H. M.

2429. Boomer & Boschert Press Co., Syracuse, N. Y.; cider jelly and sorghum evaporator, C. H. M.

2431. Harmon W. Cornell, Owego, N. Y.; hand corn sheller, C. H. M.

2434. Genesee Valley Mfg. Co., Mount Morris, N. Y.; Little Tiger fanning mill, C. M.

2436. David H. Goodell, Antrim, N. H.; apple parers, corers and slicers, C. H. M.

2446. Rochester Agricultural Works, Rochester, N. Y.; safety fly-wheel attachment to ensilage cutters, C. H. M.

2447. E. W. Ross & Co., Fulton, N. Y.; ensilage and fodder cutters, C. H. M.

2453. D. W. Seeley, Albany, N. Y.; Buckman & Seeley's patent hay and cotton press, gold medal.

2456. A. W. Stevens & Co., Auburn, N. Y.; French burr portable feed mills, C. H. M.

2457. Taylor Horse Power Co., Chicago, Ill.; the Taylor horse power, C. H. M.

2461. J. Valentine, Gorham, N. Y.; the Miller's Friend power corn-sheller and cleaner, C. M.

2462. S. B. Van Duzee Mfg. Co., Gouverneur, N. Y.; Bonanza fanning-mill, grain and seed separator and flax-seed cleaner, C. H. M.

2466. Alexander, Bradley & Dunning, Syracuse, N. Y.; portable saw-mill, C. H. M.

2467. The E. M. Birdsall Co., Auburn, N. Y.; traction steam engine, C. H. M.

2468. The E. M. Birdsall Co., Auburn, N. Y.; portable steam engine, C. M.

2478. Chas. Perrigo & Co., Groton, N. Y.; agricultural engine, C. H. M.

2482. A. C. Powell, Syracuse, N. Y.; Carley's portable circular saw-mill, C. M.

2486. Straight Line Engine Co., Syracuse, N. Y.; straight line engine, B. M.

2490. J. C. Brown, Davenport Centre, N. Y.; Crystal butter package, C. M.

2492. Chapin & Smith, Poultney, Vt.; display of churns, C. M.

2499. Philadelphia Creamery Supply Co. (limited), Philadelphia, Pa.; Danish Weston centrifugal milk separator for the immediate separation of cream from milk by centrifugal force, C. M.

2501. Vermont Farm Machine Co., Bellows Falls, Vt.; cabinet creamery, C. H. M.

2501½. Vermont Farm Machine Co., Bellows Falls, Vt.; fruit dryer, C. M.

2505. Stephen J. Adams, Willett, N. Y.; Adams' patent cow stanchion, C. M.

2508. Buffalo Scale Co., Buffalo, N. Y.; platform scales, C. H. M.

2510. D. B. Cowles, Rochester, N. Y.; suction pumps, C. M.

2512. Cronk Hanger Co., Elmira, N. Y.; slide door hanger and stay, C. M.

2512½. C. R. Jones, Syracuse, N. Y.; for rope differential pulleys, C. H. M.

2518. Erie car works (limited), Erie, Penn.; Waldo's combined road builder and grading machine, C. M.

2519. David H. Goodell, Antrim, N. H.; White Mountain hammock chair, C. M.

2523. Howard & Jennings, Syracuse, N. Y.; wooden suction and lift pumps, C. M.

2524. A. J. Ingersoll, Corning, N. Y.; the American portable fire escape, C. M.

2525. Jones of Binghamton, Binghamton, N. Y.; five ton wagon scale, C. H. M.

2529. King Adjustable Chair Co., Rochester, N. Y.; King's adjustable chairs, C. M.

2531. J. N. Knapp, Syracuse, N. Y.; improved faucets for ale and beer, C. M.

2537. Peck & Tyler, Jordan, N. Y.; power well-drill on wheels, C. M.

2538. S. Pennock & Sons Co., Chester, Penn.; Pennock's patent road machine, C. H. M.

2541. George W. Rhines, Rochester, N. Y.; improved frame for drying clothes, C. M.

2553½. National Fence Co., New York, N. Y.; for display of iron fence, C. H. M.

2557. Austin, Tomlinson & Webster Manufacturing Co., Jackson, Mich.; farm wagons and trucks, B. M.

2558. R. M. Bingham & Co., Rome, N. Y.; sleigh, cart and carriage work, C. H. M.

2558½. Thomas Brown & Co., Rochester, N. Y.; carriages, C. M.

2557½. E. D. Clapp Wagon Co., Auburn, N. Y.; for display of farm wagons, C. H. M.

2560. Hixson & Costello, Clarkson, N. Y.; Surrey canopy top and square body carriages, C. H. M.

2561. Honeoye Falls Manufacturing Co., Honeoye Falls, N. Y.; banded hub for use on road wagons, C. H. M.

2566. H. W. Marcellus, Rochester, N. Y.; Milburn farm and lumber wagons, platform spring wagons, buggies and road carts, C. H. M.

2568. H. A. Moyer, Syracuse, N. Y.; pleasure and business carts, with and without tops; side spring and side bar carriages; platform spring and buckboard wagons, C. M.; also for business carts, C. H. M.

2569. H. A. Moyer, Syracuse, N. Y.; Moyer gear, C. H. M.

2571. Pell's Spring Gear Co., Rome, N. Y.; wagon gear and body, with Pell's patent spring, C. H. M.

2574. J. A. Rowell, Amesbury, Mass.; English Surrey wagon, canopy top, single seat, C. M.

2576. Short & Smith, Syracuse, N. Y.; buggies, wagons, cutters and sleighs, B. M.

2577. Waterloo Wagon Co,, Waterloo, N. Y.; Waterloo wagons, C. H. M.

2587½. J. W. Kelley, Mt. Holley, Vt.; Excelsior shaft and pole coupling, C. M.

FARM PRODUCE.

GRAIN, SEEDS AND HOPS GROWN IN 1883.

White Winter Wheat.

W. L. Eastman, Ovid, N. Y.; first prize, ten dollars; Landreth.

A. W. Smith, Cuba, N. Y.; second prize, five dollars.

Red Winter Wheat.

M. F. Pierson, Seneca Castle, N. Y.; first prize, ten dollars; Martin's amber.

J. H. Andrews, Rochester, N. Y.; second prize, five dollars.

Spring Wheat.

George Campbell, Green's Landing, Penn.; first prize, ten dollars; red Siberian.

E. Van Allen, Bethlehem Centre, N. Y.; second prize, five dollars; Russian.

Winter Rye.

George Campbell, Green's Landing, Penn.; first prize, ten dollars; Australian.

E. Van Allen, Bethlehem Centre, N. Y.; second prize, five dollars.

Spring Rye.

George Campbell, Green's Landing, Penn.; first prize, ten dollars; Australian.

E. Van Allen, Bethlehem Centre, N. Y.; second prize, five dollars.

White Oats.

M. F. Pierson, Seneca Castle, N. Y.; first prize, ten dollars; Australian.

George Campbell, Green's Landing, Penn.; second prize, five dollars; New Welcome.

Black or Gray Oats.

George Campbell, Green's Landing, Penn.; first prize, ten dollars; Molds'.

C. L. G. Blessing, Slingerlands, N. Y.; second prize, five dollars.

Winter Barley.

C. L. G. Blessing, Slingerlands, N. Y.; second prize, five dollars.

Two-rowed Spring Barley.

George Campbell, Green's Landing, Penn.; first prize, ten dollars.

Cornelius A. Bradt, Castile, N. Y.; second prize, five dollars.

Four-rowed Spring Barley.

George Campbell, Green's Landing, Penn.; second prize, five dollars.

Yellow Indian Corn (shelled).

E. Van Allen, Bethlehem Centre, N. Y.; second prize, five dollars.

Large Field Beans.

J. H. Andrews, Rochester, N. Y.; second prize, five dollars.

Small Field Peas.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, ten dollars.

Buckwheat.

George Campbell, Green's Landing, Penn.; first prize, five dollars; Silver hull.

E. Van Allen, Bethlehem Centre, N. Y.; second prize, three dollars.

Millet.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, five dollars.

A. W. Smith, Cuba, N. Y.; second prize, three dollars.

Flax Seed.

E. Van Allen, Bethlehem Centre, N. Y.; second prize, three dollars.

Seed Ears of Yellow Corn, Eight-rowed.

C. L. G. Blessing, Slingerlands, N. Y.; first prize, five dollars.
E. Van Allen, Bethlehem Centre, N. Y.; second prize, three dollars.

Seed Ears of Yellow Corn, Twelve-rowed.

Jones Wilcox, East Chatham, N. Y.; first prize, five dollars.
C. L. G. Blessing, Slingerlands, N. Y.; second prize, three dollars.

Seed Ears of White Corn.

C. L. G. Blessing, Slingerlands, N. Y.; second prize, three dollars.

Seed Ears of Dent Corn.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, five dollars.
Charles Coolidge, Phelps, N. Y.; second prize, three dollars; White Surprise.

Seed Ears of Early Sweet Corn.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, five dollars.
Howard Bros., Irondequoit, N. Y.; second prize, three dollars.

Seed Ears of Late Sweet Corn.

C. L. G. Blessing, Slingerlands, N. Y.; first prize, five dollars.
Howard Bros., Irondequoit, N. Y.; second prize, three dollars.

VEGETABLES.

Celery.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, three dollars.
Howard Bros., Irondequoit, N. Y.; second prize, two dollars.

Cauliflowers.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, three dollars.
Howard Bros., Irondequoit, N. Y.; second prize, two dollars.

Cabbage.

Howard Bros., Irondequoit, N. Y.; first prize, three dollars.
E. Van Allen, Bethlehem Centre, N. Y.; second prize, two dollars.

Lettuce.

Howard Bros., Irondequoit, N. Y.; first prize, three dollars.

Turnips.

Howard Bros., Irondequoit, N. Y.; first prize, three dollars.

Mangolds.

A. W. Reilly, Barnard's Crossing, N. Y.; second prize, two dollars.

Beets.

Howard Bros., Irondequoit, N. Y.; first prize, three dollars.
E. Van Allen, Bethlehem Center, N. Y.; second prize, two dollars.

Orange Carrots.

E. Van Allen, Bethlehem Center, N. Y.; first prize, three dollars.
Howard Bros., Irondequoit, N. Y.; second prize, two dollars.

Parsnips.

Howard Bros., Irondequoit, N. Y.; first prize, three dollars.
A. W. Reilly, Barnard's Crossing, N. Y.; second prize, two dollars.

Salsify.

Howard Bros., Irondequoit, N. Y.; first prize, three dollars.
A. W. Reilly, Barnard's Crossing, N. Y.; second prize, two dollars.

Kohl-Rabi.

Oscar J. Lewis, Schodack Center, N. Y.; first prize, three dollars.

Onions.

E. Van Allen, Bethlehem Center, N. Y.; first prize, three dollars.
Howard Bros., Irondequoit N. Y.; second prize, two dollars.

Tomatoes.

Howard Bros., Irondequoit, N. Y.; first prize, three dollars.
E. Van Allen, Bethlehem Center, N. Y.; second prize, two dollars.

Egg Plants.

Howard Bros., Irondequoit, N. Y.; second prize, two dollars.

Garden Beans.

W. H. Underwood, East Scott, N. Y.; first prize, three dollars.
M. F. Pierson, Seneca Castle, N. Y.; second prize, two dollars.

Peppers.

E. Van Allen, Bethlehem Center, N. Y.; first prize, three dollars.
Howard Bros., Irondequoit, N. Y.; second prize, two dollars.

Squashes.

E. Van Allen, Bethlehem Center, N. Y.; first prize, three dollars.
Howard Bros., Irondequoit, N. Y.; second prize, two dollars.

Pumpkins.

E. Van Allen, Bethlehem Center, N. Y.; first prize, three dollars.
C. L. G. Blessing, Slingerlands, N. Y.; second prize, two dollars.

Potatoes — Exhibitions of Early Varieties.

Oscar J. Lewis, Schodack Centre, N. Y.; first prize, ten dollars.
M. F. Pierson, Seneca Castle, N. Y.; second prize, five dollars.

Potatoes — Exhibitions of Late Varieties.

W. H. Underwood, East Scott, N. Y.; first prize, ten dollars.
Oscar J. Lewis, Schodack Centre, N. Y.; second prize, five dollars.

Potatoes — Exhibitions of Stock Feeding Varieties.

M. F. Pierson, Seneca Castle, N. Y.; first prize, ten dollars.
Oscar J. Lewis, Schodack Centre, N. Y.; second prize, five dollars.

Collections of Vegetables.

Edwin Van Allen, Bethlehem Centre, N. Y.; first prize, twenty-five dollars.

BUTTER.

Special Prize for the Best Six Packages, not less than Thirty Pounds Net Each, Made in the Same Creamery or Private Dairy.

George W. Kinney, Stanwix, N. Y.; fifty dollars.

Packages Made at any Time in Creamery.

J. P. Straight, Laona, N. Y.; first prize, thirty dollars.
Cooper & Hawks, Laona, N. Y.; second prize, twenty dollars.
George W. Kinney, Stanwix, N. Y.; third prize, ten dollars.

Packages Made in June in Private Dairy.

A. B. Cary, West Winfield, N. Y.; first prize, thirty dollars.
C. W. Martin, South Worcester, N. Y.; second prize, twenty dollars.
P. K. Stoddard, Prattsburgh, N. Y.; third prize, ten dollars.

Packages Made at any Time in Private Dairy.

A. B. Cary, West Winfield, N. Y.; first prize, thirty dollars.
A. J. Rice, Sodus, N. Y.; second prize, twenty dollars.
P. K. Stoddard, Prattsburgh, N. Y.; third prize, ten dollars.

Moulds or Rolls.

Houghton Farm, Mountainville, N. Y.; first prize, fifteen dollars.
M. D. Chapin, Poultney, Vt.; second prize, ten dollars.
A. B. Cary, West Winfield, N. Y.; third prize, five dollars.

CHEESE.

Special Prize for the Best Dozen Cheeses, not less than Twenty Pounds each, from the Same Factory or Dairy, and Suitable for Army and other Uses.

Thomas Bros., Franklinville, N. Y.; fifty dollars.

American Cheeses over One Year Old.

W. H. Spooner, Walworth, N. Y.; second prize, twenty dollars.
Clear Spring Factory, Laona, N. Y.; third prize, ten dollars.

American Cheeses less than One Year Old.

Thomas Bros., Franklinville, N. Y.; first prize, thirty dollars.
A. J. Loomis, Cicero, N. Y.; second prize, twenty dollars.
Laona Factory, Laona, N. Y.; third prize, ten dollars.

Foreign Styles of Cheeses.

Lawrence & Durland, Chester, N. Y.; Star cream cheese, twenty-five dollars.
C. H. Green, Chester, N. Y.; Neufchatel cheese, twenty-five dollars.
J. Neuenschwander & Co., Monroe, N. Y.; Brie cheese, twenty-five dollars.

BREAD, SUGAR, ETC.

Wheaten Bread.

Mrs. J. A. Henry, Reed's Corners, N. Y.; first prize, five dollars.
E. Van Allen, Bethlehem Centre, N. Y.; second prize, three dollars; patent flour.

Rye Bread.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, five dollars.
M. E. Rich, Rochester, N. Y.; second prize, three dollars.

Indian, or Rye and Indian, Bread.

Mrs. J. A. Henry, Reed's Corners, N. Y.; first prize, five dollars.
M. H. Tennant, Rome, N. Y.; second prize, three dollars.

Maple Syrup.

Mrs. B. D. Beal, Rochester, N. Y.; first prize, five dollars.
Mrs. W. H. Graves, Blossvale, N. Y.; second prize, three dollars.

Preserved Fruits.

Oscar J. Lewis, Schodack Centre, N. Y.; first prize, five dollars.
E. Van Allen, Bethlehem Centre, N. Y.; second prize, three dollars.

Pickles in Vinegar.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, five dollars; mixed.
M. E. Rich, Rochester N. Y.; second prize, three dollars.

Dried Apples.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, five dollars.
M. H. Tennant, Rome, N, Y.; second prize, three dollars.

Dried Peaches.

Mrs. S. M. Williams, Taberg, N. Y.; first prize, five dollars.
Miss L. P. Tennant, Stanwix, N. Y.; second prize, three dollars.

Dried Whortleberries.

Mrs. S. M. Williams, Taberg, N. Y.; first prize, five dollars.
M. H. Tennant, Rome, N. Y.; second prize, three dollars.

Dried Raspberries.

E. Van Allen, Bethlehem Center, N. Y.; first prize, five dollars.
J. H. Andrews, Rochester, N. Y.; second prize, three dollars.

Box Honey.

P. Miller, Fredonia, N. Y.; first prize, five dollars.
E. Van Allen, Bethlehem Center, N. Y.; second prize, three dollars.

Extracted or Strained Honey.

J. H. Andrews, Rochester, N. Y.; first prize, five dollars.
Mrs. B. D. Beal, Rochester, N. Y.; second prize, three dollars.

DOMESTIC MANUFACTURES.

Woolen Blankets.

M. H. Tennant, Rome, N. Y.; second prize, three dollars.

All-Wool Horse Blankets.

Miss L. P. Tennant, Stanwix, N. Y.; first prize, five dollars.
Mrs. W. H. Graves, Blossvale, N. Y.; second prize, three dollars.

Woolen Cloth.

Mrs. W. H. Graves, Blossvale, N. Y.; first prize, five dollars.
Mrs. S. M. Williams, Taberg, N. Y.; second prize, three dollars.

Woolen Flannel.

M. H. Tennant, Rome, N. Y.; first prize, five dollars.
Mrs. S. M. Williams, Taberg, N. Y.; second prize, three dollars.

Woolen and Cotton Flannel.

Mrs. S. M. Williams, Taberg, N. Y.; first prize, five dollars.
Miss L. P. Tennant, Stanwix, N. Y.; second prize, three dollars.

Linsey Woolsey.

Mrs. S. M. Williams, Taberg, N. Y.; first prize, five dollars.
Mrs. W. H. Graves, Blossvale, N. Y.; second prize, three dollars.

Cotton and Wool Kersey.

Mrs. S. M. Williams, Taberg, N. Y.; second prize, three dollars.

Rag Carpet.

Mrs. T. Brown, Chili, N. Y.; first prize, five dollars.
Mrs. C. P. Sprague, Penfield, N. Y.; second prize, three dollars.

Hearth Rugs.

G. H. F. Van Horne, Fonda, N. Y.; first prize, five dollars.
Mrs. J. A. Henry, Reed's Corners, N. Y.; second prize, three dollars.

Double Carpet Coverlets.

Mrs. W. H. Graves, Blossvale, N. Y.; first prize, five dollars.
Miss L. P. Tennant, Stanwix, N. Y.; second prize, three dollars.

Linen Cloth.

Mrs. S. M. Williams, Taberg, N. Y.; second prize, three dollars.

Linen Kersey.

Mrs. W. H. Graves, Blossvale, N. Y.; second prize, three dollars.

Tow Cloth.

Mrs. W. H. Graves, Blossvale, N. Y.; second prize, three dollars.

Linen Bagging.

Mrs. S. M. Williams, Taberg, N. Y.; first prize, five dollars.
Miss L. P. Tennant, Stanwix, N. Y.; second prize, three dollars.

Knit Bed Spreads.

Clarissa Vose, Rochester, N. Y.; first prize, three dollars.
A. S. Johnson, Spencerport, N. Y.; second prize, two dollars.

Worked or Quilted Bed Spreads.

Mrs. Emmons Edson, Spencerport, N. Y.; first prize, three dollars.
Mrs. Hulbert, Rochester, N. Y.; second prize, two dollars.

Silk Quilts.

Miss M. D. Schuyler, Rochester, N. Y.; first prize, three dollars.
Mrs. H. P. Croffoot, Rochester, N. Y.; second prize, two dollars.

Balmoral Petticoats.

Mrs. W. H. Graves, Blossvale, N. Y.; first prize, three dollars.
Mrs. S. M. Williams, Taberg, N. Y.; second prize, two dollars.

Woolen Knit Stockings.

Mrs. W. H. Graves, Blossvale, N. Y.; first prize, three dollars.
Mrs. T. Brown, Chili, N. Y.; second prize, two dollars.

Worsted Knit Stockings.

Miss L. P. Tennant, Stanwix, N. Y.; first prize, three dollars.
M. H. Tennant, Rome, N. Y.; second prize, two dollars.

Woolen Knit Mittens.

A. S. Johnson, Spencerport, N. Y.; first prize, three dollars.
Mrs. J. A. Henry, Reed's Corners, N. Y.; second prize, two dollars.

Woolen Fringe Mittens.

Mrs. W. H. Graves, Taberg, N. Y.; first prize, three dollars.
Miss L. P. Tennant, Stanwix, N. Y.; second prize, two dollars.

Linen or Cotton Knit Stockings.

Miss L. P. Tennant, Stanwix, N. Y.; first prize, three dollars.
G. H. F. Van Horne, Fonda, N. Y.; second prize, two dollars.

Linen Sewing Thread.

Mrs. W. H. Graves, Blossvale, N. Y.; first prize, three dollars.
Miss L. P. Tennant, Stanwix, N. Y.; second prize, two dollars.

EXTRA AWARDS.

May A. D'Aubigne, Rochester, N. Y.; embroidered skirt and infant's carriage robe, two dollars.

Miss Julia A. Stevens, Rochester, N. Y.; oriental sofa pillow, two dollars.

FLOWERS.

PROFESSIONAL LIST.

Exhibitions of Cut Flowers.

James Vick, Rochester, N. Y.; first prize, ten dollars.

Collections of Dahlias.

James Vick, Rochester, N. Y.; first prize, six dollars.

Twenty-four Dahlias.

James Vick, Rochester, N. Y.; first prize, five dollars.

Twelve Dahlias.

James Vick, Rochester, N. Y.; first prize, three dollars.

American Seedling Dahlias.

James Vick, Rochester, N. Y.; first prize, one dollar.

Collections of Annual Phloxes.

James Vick, Rochester, N. Y.; first prize, five dollars.

Twelve Phloxes.

James Vick, Rochester, N. Y.; first prize, three dollars.

Seedling Phloxes.

James Vick, Rochester, N. Y.; first prize, one dollar.

Collections of Verbenas.

James Vick, Rochester, N. Y.; first prize, five dollars.

Twelve Varieties of Verbenas.

James Vick, Rochester, N. Y.; first prize, three dollars.
Robert J. Donnelly, Rochester, N. Y.; second prize, two dollars.

American Seedling Verbenas.

James Vick, Rochester, N. Y.; first prize, one dollar.

Collections of Asters.

James Vick, Rochester, N. Y.; first prize, three dollars.

Collections of Celosias.

James Vick, Rochester, N. Y.; first prize, three dollars.

Collections of Lilies.

James Vick, Rochester, N. Y.; first prize, three dollars.

Collections of Pansies.

Robert J. Donnelly, Rochester, N. Y.; first prize, three dollars.

Collections of Gladiolus.

James Vick, Rochester, N. Y.; first prize, three dollars.

Twelve Varieties of Gladiolus.

James Vick, Rochester, N. Y.; first prize, two dollars.

AMATEUR LIST.

Exhibitions of Cut Flowers.

Miss L. P. Tennant, Stanwix, N. Y.; first prize, ten dollars.
M. H. Tennant, Rome, N. Y.; second prize, five dollars.

Collections of Dahlias.

Miss L. P. Tennant, Stanwix, N. Y.; first prize, six dollars.
M. H. Tennant, Rome, N. Y.; second prize, three dollars.

Twelve Dahlias.

Miss L. P. Tennant, Stanwix, N. Y.; first prize, three dollars.
M. H. Tennant, Rome, N. Y.; second prize, two dollars.

Six Dahlias.

M. H. Tennant, Rome, N. Y.; first prize, two dollars.
Miss L. P. Tennant, Stanwix, N. Y.; second prize, one dollar.

Collections of Roses.

Miss L. P. Tennant, Stanwix, N. Y.; first prize, six dollars.
M. H. Tennant, Rome, N. Y.; second prize, three dollars.

Collections of Verbenas.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, five dollars.
Miss L. P. Tennant, Stanwix, N. Y.; second prize, three dollars.

Twelve Varieties of Verbenas.

Miss L. P. Tennant, Stanwix, N. Y.; first prize, three dollars.
M. H. Tennant, Rome, N. Y.; second prize, two dollars.

Six Varieties of Verbenas.

Miss L. P. Tennant, Stanwix, N. Y.; first prize, two dollars.
M. H. Tennant, Rome, N. Y.; second prize, one dollar.

Seedling Verbenas.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, one dollar.

Collections of Phloxes.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, five dollars.
Miss L. P. Tennant, Stanwix, N. Y.; second prize, three dollars.

Perennial Phloxes (six varieties named).

Miss L. P. Tennant, Stanwix, N. Y.; first prize, two dollars.
J. H. Andrews, Rochester, N. Y.; second prize, one dollar.

Seedling Phloxes.

J. H. Andrews, Rochester, N. Y.; first prize, one dollar.

Collections of Asters.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, three dollars.
M. H. Tennant, Rome, N. Y.; second prize, two dollars.

Collections of Pansies.

M. H. Tennant, Rome, N. Y.; first prize, three dollars.
J. Miller, West Brighton, N. Y.; second prize, two dollars.

Ten Weeks Stocks.

J. H. Andrews, Rochester, N. Y.; first prize, three dollars.

Collections of Gladiolus.

Miss L. P. Tennant, Stanwix, N. Y.; first prize, three dollars.
M. H. Tennant, Rome, N. Y.; second prize, two dollars.

Twelve Varieties of Gladiolus.

M. H. Tennant, Rome, N. Y.; first prize, two dollars.
Miss L. P. Tennant, Stanwix, N. Y.; second prize, one dollar.

Everlasting Flowers.

Miss L. P. Tennant, Stanwix, N. Y.; first prize, three dollars.
M. H. Tennant, Rome, N. Y.; second prize, two dollars.

GENERAL LIST — OPEN TO ALL COMPETITORS.

Collections of Pot Plants.

J. B. Keller, Rochester, N. Y.; first prize, fifteen dollars.
F. Schlegel, Rochester, N. Y.; second prize, ten dollars.

Twenty Greenhouse and Stove Plants.

J. B. Keller, Rochester, N. Y.; first prize, ten dollars.

Ten Greenhouse and Stove Ptants.

J. B. Keller, Rochester, N. Y.; first prize, five dollars.

Groups of Palms.

F. Schlegel, Rochester, N. Y.; first prize, eight dollars.
J. B. Keller, Rochester, N. Y.; second prize, four dollars.

Groups of Ferns.

J. B. Keller, Rochester, N. Y.; first prize, five dollars.
F. Schlegel, Rochester, N. Y.; second prize, three dollars.

Six Varieties of Variegated Leaved Plants.

J. B. Keller, Rochester, N. Y.; first prize, five dollars.
F. Schlegel, Rochester, N. Y.; second prize, three dollars.

Single Variegated Leaved Plants.

J. B. Keller, Rochester, N. Y.; first prize, two dollars.

Twelve Zonal Pelargoniums (Single).

J. B. Keller, Rochester, N. Y.; first prize, five dollars.

One Zonal Pelargonium (Single).

J. B. Keller, Rochester, N. Y.; first prize, two dollars.

Six Zonal Pelargoniums (Double).

J. B. Keller, Rochester, N. Y.; first prize, three dollars.

One Zonal Pelargonium (Double).

J. H. Andrews, Rochester, N. Y.; first prize, two dollars.

Pairs of Hand Bouquets.

J. B. Keller, Rochester, N. Y.; first prize, five dollars.
Robert J. Donnelly, Rochester, N. Y.; second prize, three dollars.

Pairs of Table Bouquets.

J. B. Keller, Rochester, N. Y.; first prize, five dollars.
Robert J. Donnelly, Rochester, N. Y.; second prize, three dollars.

Button-hole Bouquets.

J. B. Keller, Rochester, N. Y.; first prize, three dollars.

Baskets of Flowers.

J. B. Keller, Rochester, N. Y.; first prize, five dollars.
Robert J. Donnelly, Rochester, N. Y.; second prize, three dollars.

Pairs of Hanging Baskets.

J. B. Keller, Rochester, N. Y.; first prize, three dollars.
J. H. Andrews, Rochester, N. Y.; second prize, two dollars.

FRUITS.

PROFESSIONAL LIST.

Collections of Apples.

Ellwanger & Barry, Rochester, N. Y.; first prize, ten dollars.

Twenty Varieties of Apples.

Ellwanger & Barry, Rochester, N. Y.; first prize, eight dollars.

Collections of Pears.

Ellwanger & Barry, Rochester, N. Y.; first prize, fifteen dollars.

Twenty Varieties of Pears.

Ellwanger & Barry, Rochester, N. Y.; first prize, ten dollars.

Ten Varieties of Pears.

Ellwanger & Barry, Rochester, N. Y.; first prize, five dollars.

Collections of Peaches.

Ellwanger & Barry, Rochester, N. Y.; first prize, five dollars.

Three Varieties of Peaches.

Ellwanger & Barry, Rochester, N. Y.; first prize, three dollars.

Dish of One Variety of Peaches.

Ellwanger & Barry, Rochester, N. Y.; first prize, two dollars.

Collections of Plums.

Ellwanger & Barry, Rochester, N. Y.; first prize, five dollars.

Five Varieties of Plums.

Ellwanger & Barry, Rochester, N. Y.; first prize, three dollars.

Dish of One Variety of Plums.

Ellwanger & Barry, Rochester, N. Y.; first prize, two dollars.

Quinces.

Ellwanger & Barry, Rochester, N. Y.; first prize, two dollars.

Ten Varieties of Native Grapes.

B. W. Clark, Lockport, N. Y.; first prize, ten dollars.

Five Varieties of Native Grapes.

B. W. Clark, Lockport, N. Y.; first prize, five dollars.

AMATEUR LIST.

Collections of Apples.

H. Hoffman, Elba, N. Y.; first prize, ten dollars.
M. F. Pierson, Seneca Castle; second prize, five dollars.

Ten Varieties of Apples.

H. Hoffman, Elba, N. Y.; first prize, five dollars.
J. H. Andrews, Rochester, N. Y.; second prize, three dollars.

Five Varieties of Apples.

H. Hoffman, Elba, N. Y.; first prize, three dollars.
Mrs. B. D. Beal, Rochester, N. Y.; second prize, two dollars.

Ten Varieties of Pears.

H. W. Peck, Rochester, N. Y.; first prize, five dollars.
Wm. H. Pillow, Rochester, N. Y.; second prize, three dollars.

Five Varieties of Pears.

Wm. H. Pillow, Rochester, N. Y.; first prize, three dollars.
J. T. Sproat, Rochester, N. Y.; second prize, two dollars.

Five Varieties of Peaches.

M. F. Pierson, Seneca Castle, N. Y.; first prize, three dollars.
George Bahringer, Rochester, N. Y.; second prize, two dollars.

Dish of One Variety of Peaches.

George C. Snow, Penn Yan, N. Y.; first prize, two dollars.
J. S. Stone, Rochester, N. Y.; second prize, one dollar.

Five Varieties of Plums.

H. Hoffman, Elba, N. Y.; first prize, three dollars.
Wm. H. Pillow, Rochester, N. Y.; second prize, two dollars.

Three Varieties of Plums.

George Bahringer, Rochester, N. Y.; first prize, two dollars.
Wm. H. Pillow, Rochester, N. Y.; second prize, one dollar.

Dish of Ten Specimens of Plums.

Wm. H. Pillow, Rochester, N. Y.; first prize, one dollar.

Quinces.

J. S. Stone, Charlotte, N. Y.; first prize, two dollars.
George Bahringer, Rochester, N. Y.; second prize, one dollar.

Ten Varieties of Native Grapes.

George Bahringer, Rochester, N. Y.; first prize, six dollars.
Wm. H. Pillow, Rochester, N. Y.; second prize, three dollars.

Five Varieties of Native Grapes.

Wm. H. Pillow, Rochester, N. Y.; first prize, three dollars.

FRUITS, SINGLE DISHES, OPEN TO ALL.

APPLES.

Baldwin.

H. Hoffman, Elba, N. Y.; two dollars.

King of Tompkins County.

H. Hoffman, Elba, N. Y.; two dollars.

Northern Spy.

Wm. H. Pillow, Rochester, N. Y.; two dollars.

Rhode Island Greening.

H. Hoffman, Elba, N. Y.; two dollars.

Roxbury Russet.

H. Hoffman, Elba, N. Y.; two dollars.

Twenty Ounce.

H. Hoffman, Elba, N. Y.; two dollars.

PEARS.

Bartlett.

Wm. H. Pillow, Rochester, N. Y.; two dollars.

Buerre d'Anjou.

J. T. Sproat, Rochester, N. Y.; two dollars.

Buerre Clairgeau.

H. N. Peck, Rochester, N. Y.; two dollars.

Duchess d'Angouleme.

Wm. H. Pillow, Rochester, N. Y.; two dollars.

Flemish Beauty.

H. N. Peck, Rochester, N. Y.; two dollars.

Seckel.

Wm. H. Pillow, Rochester, N. Y.; two dollars.

Lawrence.

Wm. H. Pillow, Rochester, N. Y.; two dollars.

Winter Nelis.

Wm. H. Pillow, Rochester, N. Y.; two dollars.

GRAPES.

Concord.

George Bahringer, Rochester, N. Y.; two dollars.

Catawba.

Mrs. B. D. Beal, Rochester, N. Y.; two dollars.

Delaware.

, Rochester, N. Y.; two dollars.

Hartford.

George Bahringer, Rochester, N. Y.; two dollars.

Isabella.

Wm. H. Pillow, Rochester, N. Y.; two dollars.

Any of Rogers' Varieties.

George Bahringer, Rochester, N. Y.; two dollars.

AWARDS

AT THE

FORTY-FOURTH ANNUAL CATTLE SHOW AND FAIR OF THE NEW YORK STATE AGRICULTURAL SOCIETY, HELD AT ELMIRA, SEPTEMBER 4–10, 1884.

CATTLE.

SHORTHORNS.

Shorthorn Herd Prize.

Daniel B. Haight, Dover Plains, N. Y.; large gold medal.

Bull, Waterloo 9th, roan, bred by exhibitor; calved March 23, 1883, sire Lord of Rowfant, 44198, dam Constance of Brookdale 5th by Oneida Prince, 27359, gr. d. Constance of Lyndale 8th by 7th Lord Oxford, 17586.

Cow, Constance of Lyndale 8th, roan, bred by W. S. King, Minneapolis, Minn.; calved March 10, 1876, sire Seventh Lord Oxford, 17586, dam Constance of Lyndale 2d by Scotsman (27435), gr. d. Constance 6th by Seventh Duke of Airdrie (23718).

Cow, Constance of Brookdale, roan, bred by W. S. King, Minneapolis, Minn.; calved March 5, 1877, sire Wild Eyes Duke, 21325, dam Constance 6th by Seventh Duke of Airdrie (23718), gr. d. Constance 3d by Clifton Duke (23580).

Cow, Constance of Brookdale 4th, roan, bred by exhibitor; calved September 24, 1878, sire Oneida Prince, 27359, dam Constance 6th by Seventh Duke of Airdrie (23718), gr. d. Constance 3d by Clifton Duke (23580).

Cow, Constance of Brookdale 5th, roan, bred by exhibitor; calved May 18, 1879, sire Oneida Prince, 27539, dam Constance of Lyndale 8th by Seventh Lord Oxford, 17586, gr. d. Constance of Lyndale 2d by Scotsman (27435).

Cow, Constance of Brookdale 6th, roan, bred by exhibitor; calved June 20, 1879, sire Oneida Prince, 27539, dam Constance of Lyndale 2d by Scotsman (27435), gr. d. Constance 6th by Seventh Duke of Airdrie (23718).

Shorthorn Bulls, over Three Years Old.

F. C. Lowman, Nichols, N. Y.; first prize, fifty dollars; Roan Chief, roan, bred by exhibitor; calved July 11, 1879, sire Emperor 2d, 38780, dam Topsy by Emperor, 14196, gr. d. Jennie by Maximilian, 6362.

Andrew Bowen, Elmira, N. Y.; second prize, twenty-five dollars; 8th Duke of Bath, roan, bred by Charles H. Robie, Savona, N. Y.; calved March 1, 1881, sire Airdrie Boy, 34171, dam Rose 2d by Monarch 2d, 15930, gr. d. Rose by Alaric, 18863.

Shorthorn Bulls, Two Years Old.

A. F. Stearns & Sons, Marion, N. Y.; first prize, forty dollars; Duke of Aylmer 4th, roan, bred by Canada West Farm Stock Association, Brantford, Canada; calved February 11, 1882, sire 4th Duke of Clarence, 26188, dam Duchess of Aylmer 3d by 4th Duke of Barrington, 16708, gr. d. Duchess of Dereham 6th by Lord Barrington, 17550.

Thomas Boak & Son, Gerry, N. Y.; second prize, twenty dollars; Hopeful, roan, bred by J. & W. Watt, Salem, Ontario; calved November 3, 1881, sire Brampton Hero—* 278—, dam Mayflower by Under Sheriff—416—, gr. d. Mayflower 3d by Roger, 10892.

Shorthorn Bulls, One Year Old.

Daniel B. Haight, Dover Plains, N. Y.; first prize, thirty dollars; Waterloo 9th, roan, bred by exhibitor; calved March 23, 1883, sire Lord of Rowfant, 44198, dam Constance of Brookdale 5th by Oneida Prince, 27359, gr. d. Constance of Lyndale 8th by 7th Lord Oxford, 17586.

George H. Bell, Rome, N. Y.; second prize, fifteen dollars; 5th Airdrie Duke of Constance, red, bred by J. Talcott & Son, Rome, N. Y.; calved May 23, 1883, sire Earl of Glen†, dam Lady Constance 3d by Lord Mayor, 6969, gr. d. Constance 4th by 7th Duke of Airdrie, 5532.

Shorthorn Bull Calves.

Thomas Boak & Son, Gerry, N. Y.; first prize, ten dollars; Robin Hood, dark roan, bred by exhibitors; calved December 18, 1883, sire Hopeful, dam Lady Rothesay by Duke of Rothesay—324—, gr. d. Duchess of Cumberland by Duke of Cumberland—12—.

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* Numbers printed thus—278—, refer to the British-American Herd-book.

† By Glen Oxford 2d, 32721, dam Maud 6th by Earl of Cambridge, 23018, gr. d. Maud 3d by Oxford Duke, 18775.

Thomas Boak & Son, Gerry, N. Y.; second prize, five dollars; Royal Hope, roan, bred by exhibitors; calved December 20, 1883, sire Hopeful, dam Roseberry by Duke of Cumberland—12—, gr. d. Strawberry by Rock—34—.

Shorthorn Cows, over Three Years Old.

Daniel B. Haight, Dover Plains, N. Y.; first prize, forty dollars; Constance of Lyndale 8th, roan, bred by W. S. King, Minneapolis, Minn.; calved March 10, 1876, sire Seventh Lord Oxford, 17586, dam Constance of Lyndale 2d by Scotsman (27435), gr. d. Constance 6th by Seventh Duke of Airdrie (23718).

Thomas Boak & Son, Gerry, N. Y.; second prize, twenty dollars; Ruby's Butterfly, roan, bred by C. P. Preston, Hornby, Ontario; calved March 23, 1876, sire Duke of Cumberland—12—, dam Ruby by Butterfly 2d, 7637, gr. d. Easter Eve by John o 'Gaunt 2d, 13089.

Shorthorn Heifers, Two Years Old.

A. B. Benham, Cortland, N. Y.; first prize, thirty dollars; Red Pink, red and white, bred by exhibitor; calved April, 1882, sire Knightly Duke 3d, 46398, dam Pink 3d by General Grant, 25371, gr. d. Pink by St. Valentine, 4348½.

Shorthorn Heifers, One Year Old.

W. C. Albertson, North Rush, N. Y.; first prize, twenty dollars; Maggie 3d, red, bred by exhibitor; calved August 2, 1883, sire 2d Earl of Oxford,* dam Maggie 2d by Bismarck, 13496, gr. d. Maggie by Prince of Wales (18630).

Thomas Boak & Son, Gerry, N. Y.; second prize, ten dollars; Ruby's Eve, roan, bred by exhibitors; calved October 6, 1882, sire High Sheriff 3d—281—, dam Ruby's Butterfly by Duke of Cumberland—12—, gr. d. Ruby by Butterfly 2d, 7637.

Shorthorn Heifer Calves.

Thomas Boak & Son, Gerry, N. Y.; first prize, ten dollars; Farewell 4th, roan, bred by exhibitors; calved December 2, 1883, sire Hopeful, dam Farewell 2d by Duke of Cumberland—12—, gr. d. Farewell by Royal Westmoreland (35416).

Thomas Boak & Son, Gerry, N. Y.; second prize, five dollars; Countess 3d, bred by exhibitors; calved December 7, 1883, sire Hopeful, dam Countess by Duke of Cumberland—12—, gr. d. Farewell by Royal Westmoreland (35416).

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*Bred by Benjamin Fellows, Clifton, N. Y.; sire Earl of Oxford, 35422, dam Rose Louan 1st by Sensation, 2949, gr. d. Rose Louan by Major, 10425.

DEVONS.

Devon Herd Prize.

A. F. Bronson, Vernon, N. Y.; large gold medal.

Bull, West Shore, bred by exhibitor; calved November 21, 1882, sire Jeddo, 1809, dam Lady Hartland by Litchfield, 789, gr. d. Esma by Tasso, 1163.

Cow, Sunshine, bred by E. W. Davis, Oneida, N. Y.; calved September 16, 1877, sire Litchfield, 789, dam Cherry by Conewango, 428, gr. d. Fruitful by Roscius, 1072.

Cow, Victoria, bred by George Rudd, Guelph, Canada; calved October 10, 1878, sire Prince Albert Victor, 227½, dam Maid of Honor by Hartland, 655, gr. d. Cherry Pie by Young Curly Prince of Wales, 440.

Heifer, Red Bud, bred by exhibitor; calved May 11, 1882, sire Jeddo, 1809, dam Nameless 2d by Doctor, 462, gr. d. Nameless by Litchfield, 789.

Heifer, Laura Don, bred by exhibitor; calved October 20, 1882, sire Jeddo, 1809, dam Sunshine by Litchfield, 789, gr. d. Cherry by Conewango, 428.

Heifer, Countess of Carnaby, bred by exhibitor; calved February 13, 1883, sire Jeddo, 1809, dam Victoria by Prince Albert Victor, 227½, gr. d. Maid of Honor by Hartland, 655.

Devon Bulls, over Three Years Old.

Joseph Hilton, New Scotland, N. Y.; first prize fifty dollars; Prince of Wales 20th, bred by exhibitor; calved December 12, 1878, sire Crown Prince, 434, dam Edith 9th by Prince of Wales, 151, gr. d. Fanny by Prince of Wales, 151.

Banker Brothers, Franklin Forks, Penn.; second prize, twenty-five dollars; Prince of Wales 19th, bred by Joseph Hilton, New Scotland, N. Y.; calved January 1, 1878, sire Prince of Wales 11th, 1101, dam Edith 5th by Prince of Wales, 151, gr. d. Edith 2d by Sachem, 1089.

Devon Bulls, Two Years Old.

Joseph Hilton, New Scotland, N. Y.; first prize, forty dollars; Prince of Devons, bred by exhibitor; calved October 2, 1881, sire Prince of Wales 20th, 1395, dam Edith 12th by Prince of Wales, 151, gr. d. Edith 4th by Prince of Wales, 151.

J. A. Pomeroy, Sidney Centre, N. Y.; second prize, twenty dollars; Troilus, bred by exhibitor; calved June 16, 1882, sire Uncas, 1196, dam Lily by Huron 2d, 704, gr. d. Extra by Bishop, 306.

Devon Bulls, One Year Old.

A. F. Bronson, Vernon, N. Y.; first prize, thirty dollars; West Shore, bred by exhibitor; calved November 21, 1882, sire Jeddo, 1809, dam Lady Hartland by Litchfield, 789, gr. d. Esma by Tasso, 1163.

Joseph Hilton, New Scotland, N. Y.; second prize, fifteen dollars; Prince Taurus, bred by exhibitor; calved January 19, 1883, sire Prince of Wales 20th, 1395, dam Edith 16th by Crown Prince, 434, gr. d. Edith 12th by Prince of Wales, 151.

Devon Bull Calves.

Joseph Hilton, New Scotland, N. Y.; first prize, ten dollars; Retainer, bred by exhibitor; calved January 2, 1884, sire Prince of Wales 20th, 1395, dam Edith 16th by Crown Prince, 434, gr. d. Edith 12th by Prince of Wales, 151.

D. Wait & Son, Wells' Bridge, N. Y.; second prize, five dollars; Boston Drummer, bred by exhibitors; calved December 28, 1883, sire Trim Tiger, 2493, dam Beauty Blest by Delaware, 1835, gr. d. Beauty by Madison Chief, 814.

Devon Cows, over Three Years Old.

Banker Brothers, Franklin Forks, Penn.; first prize, forty dollars; Bright Promise, bred by exhibitors; calved April 1, 1875, sire Prince of Wales 12th, 1002, dam Rose of Baltimore 3d by Comet, 420, gr. d. Rose of Baltimore 1st by Bloomfield, 313.

D. Wait & Son, Wells' Bridge, N. Y.; second prize, twenty dollars; Candy Girl, bred by exhibitors; calved April 25, 1878, sire Candy 2d, 364, dam Queen of Cloverdell by Otsego 1st, 929, gr. d. Funny by Tinsel, 1176.

Devon Heifers, Two Years Old.

Banker Brothers, Franklin Forks, Penn.; first prize, thirty dollars; Effie Rose, bred by exhibitors; calved April 2, 1882, sire Prince of Wales 19th, 1919, dam Rose of Baltimore 7th by Prince of Wales 15th, 1004, gr. d. Rose of Baltimore 1st by Bloomfield, 313.

Joseph Hilton, New Scotland, N. Y.; second prize, fifteen dollars; Patience, bred by exhibitor; calved January 24, 1882, sire Prince of Wales 20th, 1395, dam Edith 16th by Crown Prince, 434, gr. d. Edith 12th by Prince of Wales, 151.

Devon Heifers, One Year Old.

Joseph Hilton, New Scotland, N. Y.; first prize, twenty dollars; Maid of Utica, bred by exhibitor; calved September 25, 1882, sire Prince John H., 2458, dam Edith 12th by Prince of Wales, 151, gr. d. Edith 4th by Prince of Wales, 151.

A. F. Bronson, Vernon, N. Y.; second prize, ten dollars; Countess of Carnaby, bred by exhibitor; calved February 13, 1883, sire Jeddo, 1809, dam Victoria by Prince Albert Victor, 227½, gr. d. Maid of Honor by Hartland, 655.

Devon Heifer Calves.

A. F. Bronson, Vernon, N. Y.; first prize, ten dollars; Hazel Kirk, bred by exhibitor; calved January 11, 1884, sire Jeddo, 1809, dam Victoria by Prince Albert Victor, 227½, gr. d. Maid of Honor by Hartland, 655.

Rumsey Brothers, Westfield, N. Y.; second prize, five dollars; Dreamer, bred by A. W. Rumsey, Westfield, N. Y.; calved December 28, 1883, sire True Briton, 2471, dam Viola by Cole's Puritan 3d, 406, gr. d. Helena 32d by Comet, 34.

HEREFORDS.

Hereford Bulls, over Three Years Old.

John L. Northrup, Westfield, N. Y.; first prize, fifty dollars; Santa Claus, bred by H. T. Smith, Berlin Heights, Ohio; calved December 25, 1880, sire Young America, 4231, dam May Queen by Bristol Bill, 555, gr. d. Duchess 2d by John Bull, 464.

Hereford Bulls, One Year Old.

John L. Northrup, Westfield, N. Y.; first prize, thirty dollars; Monkhall 4th, bred by T. M. Bennett, Herefordshire, England; calved June 3, 1883, sire Moonraker 3d (6077), dam Butterfly 3d by Cupid (5283), gr. d. Butterfly by Kingstone (3896).

Hereford Bull Calves.

John L. Northrup, Westfield, N. Y.; first prize, ten dollars; Chautauqua Boy, bred by exhibitor; calved April 1, 1884, sire Santa Claus, 5820, dam Charmer 2d by Premier, 4845, gr. d. Charmer by Dorset, 4950.

Hereford Cows, over Three Years Old.

John L. Northrup, Westfield, N. Y.; first prize, forty dollars; Charmer 2d, bred by W. R. Grose, Wadebridge, England; calved June 9, 1878, sire Premier, 4845, dam Charmer by Dorset, 4950, gr. d. Baroness by Zippor, 4844.

Hereford Heifers, One Year Old.

John L. Northrup, Westfield, N. Y.; first prize, twenty dollars; Victoria, bred by W. R. Grose, Wadebridge, England; calved March 4, 1883, sire Thickset (6729), dam Queen 2d by Premier, 4845, gr. d. Hannah by Character 3d (3739).

AYRSHIRES.

Ayrshire Herd Prize.

A. S. Tubbs, Mexico, N. Y.; large gold medal.

Bull, Shirley Douglas, red, bred by Joseph F. Brown, Providence, R. I.; calved July 31, 1880, sire Enoch Douglas, 2001, dam Floyd Douglas by Lord Lyon, 691, gr. d. Jessie Douglas by McIvor, 46.

Cow, Dahlia 2d, red and white, bred by J. F. Converse, Woodville, N. Y.; calved May 6, 1872, sire Woodville Chief, 1542, dam Dahlia, imported by Mr. Converse.

Cow, Dahlia 5th, red and white, bred by J. F. Converse, Woodville, N. Y.; calved April 15, 1876, sire Woodville Chief, 1542, dam Dahlia, imported by Mr. Converse.

Cow, Leda Belle, red and white, bred by Mr. Lewis Tubbs & Son, Mexico, N. Y.; calved April 10, 1881, sire Mexico Prince, 2431, dam Besse Belle by Walter Scott, 2106, gr. d. Madison Belle by Nimrod, 1356.

Heifer, Clara Drummond, red and white, bred by J. F. Converse, Woodville, N. Y.; calved October 1, 1882, sire Major Drummond, 2006, dam Eyebright by General Grant, 176, gr. d. Brighteyes by John Gilpin, 222.

Heifer, Vinewood Queen, red, bred by exhibitor; calved May 18, 1883, sire Shirley Douglas, 2742, dam Dahlia 5th by Woodville Chief, 1542, gr. d. Dahlia, imported by J. F. Converse.

Ayrshire Bulls, Over Three Years Old.

A. S. Tubbs, Mexico, N. Y.; first prize, fifty dollars; Shirley Douglas, red, bred by Joseph F. Brown, Providence, R. I.; calved July 31, 1880, sire Enoch Douglas, 2001, dam Floy Douglas by Lord Lyon, 691, gr. d. Jessie Douglas by McIvor, 46.

Eugene Ham, Verbank, N. Y.; second prize, twenty-five dollars; Dagmar, brown and white, bred by exhibitor; calved July 24, 1881, sire McWhirter, 2660, dam Miss Dollie by Sultan, 364, gr. d. Dolly by Dandy 5th, 1580.

Ayrshire Bulls, Two Years Old.

Ormiston Bros., Cuba, N. Y.; first prize, forty dollars; Joe Anderson, white and red, bred by exhibitors; calved April 18, 1882, sire William Mars, 2794, dam Lady Mariam, imported October 6, 1873, by Moyer & McAdam, Perrysburgh, N. Y.

George H. Bell, Rome, N. Y.; second prize, twenty dollars; Winfield 3d, red and white, bred by exhibitor; calved March 17, 1882, sire Winfield Boy, 2610, dam Draxy Miller by Treasurer, 1509, gr. d. Pet by Rob Roy, 325.

Ayrshire Bulls, One Year Old.

Eugene Ham, Verbank, N. Y.; first prize, thirty dollars; Obie Douglas, dark red and white, bred by Obadiah Brown, Providence, R. I.; calved March 3, 1883, sire Enoch Douglas, 2001, dam Ethel Douglas 2d by Prince Edward, 787, gr. d. Ethel Douglas by Lord Lyon, 691.

A. S. Tubbs, Mexico, N. Y.; second prize, fifteen dollars; Dandie Douglas, red mottle-faced, bred by exhibitor; calved November 14, 1882, sire Shirley Douglas, 2742, dam Dahlia 2d by Woodville Chief, 1542, gr. d. Dahlia, imported by J. F. Converse.

Ayrshire Bull Calves.

A. S. Tubbs, Mexico, N. Y.; first prize, ten dollars; Vic Douglas, red, bred by exhibitor; calved March 16, 1884, sire Shirley Douglas, 2742, dam Dahlia 2d by Woodville Chief, 1542, gr. d. Dahlia, imported by J. F. Converse.

Harper W. Dewey, Sidney Centre, N. Y.; second prize, five dollars; Harry Cooper, red and white, bred by Clarence Chamberlain, Franklin, N. Y.; calved February 19, 1884, sire John Bright, 2802, dam Lady Cooper by Champion, 1569, gr. d. Rosey, imported by M. H. Cochrane, Compton, Canada.

Ayrshire Cows, over Three Years Old.

Ormiston Brothers, Cuba, N. Y.; first prize, forty dollars; May Morn, red with a little white, bred by Gilchrist Parkiston, Darvel, Scotland; calved 1871, imported September, 1873, by John L. Gibb, Compton, Canada.

A. S. Tubbs, Mexico, N. Y.; second prize, twenty dollars; Dahlia 5th, red and white, bred by John F. Converse, Woodville, N. Y.; calved April 15, 1876, sire Woodville Chief, 1542, dam Dahlia, imported by Mr. Converse.

Ayrshire Heifers, Two Years Old.

Ormiston Brothers, Cuba, N. Y.; first prize, thirty dollars; Bessie King, white and red, bred by Jardine & Sons, Hamilton, Ont.; calved May 15, 1882, sire Forest King,* dam Bessie Mars by Mars 1st, 2177, gr. d. Bonny Jess, imported July, 1873, by Jardine & Sons.

George H. Bell, Rome, N. Y.; second prize, fifteen dollars; Draxy's Daughter 2d, red and white, bred by exhibitor; calved July 25, 1882, sire Winfield Boy, 2610, dam Draxy's Daughter by Gansevoort, 2612, gr. d. Draxy Miller by Treasurer, 1509.

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* By Mars 1st, 2177, dam Jean Muir by Billy Muir, 2795, gr. d. Bonny Jess, imported by Jardine & Sons.

Ayrshire Heifers, One Year Old.

A. S. Tubbs, Mexico, N. Y.; first prize, twenty dollars; Clara Drummond, red and white, bred by J. F. Converse, Woodville, N. Y.; calved October 1, 1882, sire Major Drummond, 2006, dam Eyebright by General Grant, 176, gr. d. Brighteyes by John Gilpin, 222.

A. S. Tubbs, Mexico, N. Y.; second prize, ten dollars; Vinewood Queen, red, bred by exhibitor; calved May 18, 1883, sire Shirley Douglas, 2742, dam Dahlia 5th by Woodville Chief, 1542, gr. d. Dahlia, imported by J. F. Converse.

Ayrshire Heifer Calves.

Harper W. Dewey, Sidney Centre, N. Y.; first prize, ten dollars; Ladyship, red and white, bred by exhibitor; calved November 11, 1883, sire Musician, 3640, dam Fret by Major, 2757, gr. d. Margaret by Trump, 2501.

B. G. Foster, Vernon, N. Y.; second prize, five dollars; Queen of the Farm, dark red with white spots, bred by exhibitor; calved March 19, 1884, sire Camper, 2609, dam Joan 3d by Kilmarnock 25th, 2329, gr. d. Joan, imported January 10, 1879, by P. H. Fowler, Watford, Herts, England.

HOLSTEINS.

Holstein Herd Prize.

Smiths & Powell, Syracuse, N. Y.; large gold medal.

Bull, Netherland Prince, black and white, bred by A. C. Koning, Beemster, North Holland; calved April 1, 1880, imported October, 1880, by exhibitors; sire Schemmel, dam Lady Netherland.

Cow, Ægis, black and white, bred by Gerrit S. Miller, Peterborough, N. Y.; calved October 2, 1873, sire Rip Van Winkle, 35, dam Agoo, imported in 1869 in dam Dowager by G. S. Miller.

Cow, Netherland Baroness, black and white, bred by Jan Van der Meer, Beemster, North Holland; calved March 15, 1877, imported by exhibitors, September, 1882; sire District Bull, dam Gert Met 3d.

Cow, Netherland Queen, black and white, bred by A. C. Koning, Beemster, North Holland; calved March 26, 1877, imported by exhibitors in 1878.

Cow, Netherland Duchess, black and white; calved March 30, 1878, imported by exhibitors in 1879.

Cow, Clothilde, black and white, bred by J. Stijl, Beemster, North Holland; calved March, 1879, imported by exhibitors in 1880.

Holstein Bulls, over Three Years Old.

Smiths & Powell, Syracuse, N. Y.; first prize, fifty dollars; Netherland Prince, black and white, bred by A. C. Koning, Beemster, North Holland; calved April 1, 1880, imported October, 1880, by exhibitors; sire Schemmel, dam Lady Netherland.

S. Maxwell McIntyre, Dresden, N. Y.; second prize, twenty-five dollars; Dick Swiveler, black and white, calved March 27, 1880; imported in dam Moselle by Gerrit S. Miller, Peterborough, N. Y.

Holstein Bulls, Two Years Old.

H. E. Boardman, Rochester, N. Y.; first prize, forty dollars; Consolation, black and white, bred by G. Wydenes, North Holland; calved March 25, 1882, imported by exhibitor in June, 1883; sire Koster (155, N. H. B.).

Smiths & Powell, Syracuse, N. Y.; second prize, twenty dollars; Prince Imperial, black and white, bred by exhibitors; calved April 15, 1882, sire Netherland Prince, 716, dam Carlotta, imported by exhibitors in 1880.

Holstein Bulls, One Year Old.

Smiths & Powell, Syracuse, N. Y.; first prize, thirty dollars; Prince of Artis, black and white, bred by J. Man, Beemster, North Holland; calved March 10, 1883, imported August, 1883, by exhibitors; sire Artis (127, N. H. B.), dam Lieze 2d.

H. E. Boardman, Rochester, N. Y.; second prize, fifteen dollars; Rochester, black and white, bred by Dan Wydenes, North Holland; calved February 16, 1883, sire Napoleon (129, N. H. B.), dam Koster.

Holstein Bull Calves.

Smiths & Powell, Syracuse, N. Y.; first prize, ten dollars; Aaggie Idaline 4th's Roland, black and white; calved February 18, 1884, imported August, 1883, in dam Aaggie Idaline 4th, by exhibitors.

H. E. Boardman, Rochester, N. Y.; second prize, five dollars; Ready, white and black; calved February 24, 1884, imported June, 1883, by exhibitor in dam Bissibel, sire Pel (122, F. H. B.).

Holstein Cows, over Three Years Old.

Smiths & Powell, Syracuse, N. Y.; first prize, forty dollars; Ægia, black and white, bred by Gerrit S. Miller, Peterborough, N. Y.; calved October 2, 1873, sire Rip Van Winkle, 35, dam Agoo, imported in 1869, by G. S. Miller, in dam Dowager.

Smiths & Powell, Syracuse, N. Y.; second prize, twenty dollars; Netherland Queen, black and white, bred by A. C. Koning, Beemster, North Holland; calved March 26, 1877, imported by exhibitors in 1878.

Holstein Heifers, Two Years Old.

Smiths & Powell, Syracuse, N. Y.; first prize, thirty dollars; Executrix, black and white, bred by P. Nes, Midwoud, North Holland; calved March 15, 1882, imported by exhibitors in 1883, sire Willem (84 N. H. B.), dam Stapel.

Smiths & Powell, Syracuse, N. Y.; second prize, fifteen dollars; Netherland Baroness 4th, black and white, bred by Jan Vander Meer, Beemster, North Holland; calved March 14, 1882, imported by exhibitors in 1882, sire Noome, dam Netherland Baroness.

Holstein Heifers, One Year Old.

Smiths & Powell, Syracuse, N. Y.; first prize, twenty dollars, Mercede 3d, black and white, bred by Thos. B. Wales, Jr., Iowa City, Iowa; calved February 24, 1883, sire Mehomet 289, dam Mercedes, imported by Thos. B. Wales, Jr., in 1879.

Smiths & Powell, Syracuse, N. Y.; second prize, ten dollars; Prunella 2d, black and white, bred by exhibitors; calved March 1, 1883, imported August, 1882, in dam Prunella.

Holstein Heifer Calves.

Smiths & Powell, Syracuse, N. Y.; first prize, ten dollars; Silence 2d, bred by exhibitors; calved April 5, 1884, sire Prince Imperial, 1164, dam Silence, imported by exhibitors in 1882.

Smiths & Powell, Syracuse, N. Y.; second prize, five dollars; Netherland Peeress 2d, black and white, bred by exhibitors; calved March 6, 1884, sire Prince Imperial, 1164, dam Netherland Peeress, imported by exhibitors in 1882.

JERSEYS.

Jersey Herd Prize.

A. Baker, West Dryden, N. Y.; large gold medal.

Bull, Czar of Mapleton, dark fawn, bred by exhibitor; calved March 10, 1882, sire Noble of Guilford, 9261, dam Daisy of Guilford by Prince of Sidney, 2665, gr. d. Daisy by Jersey Boy, 272.

Cow, Cream of Sidney, fawn, bred by Joseph Sweet, Unadilla, N. Y.; calved May 14, 1876, sire Noble, 901, dam Rosetta of Sidney by Paddy, 899, gr. d. Dahlia of Babylon, imported November, 1871.

Cow, Queen of Delaware, dark fawn, bred by Joseph Sweet, Unadilla, N. Y.; calved May 8, 1878, sire Noble, 901, dam Jennie of Sidney by Noble 901, gr. d. Rosetta of Sidney by Paddy, 899.

Cow, Daisy of Guilford, dark fawn, bred by Thomas Ward, Franklin, N. Y.; calved March 5, 1879, sire Prince of Sidney, 2665, dam Daisy by Jersey Boy, 272, gr. d. Diana by Diamond, 155.

Cow, Trix of Mapleton, fawn, bred by Joseph Sweet, Unadilla, N. Y.; calved May 30, 1881, sire Noble of Sidney, 5309, dam Cream of Sidney by Noble, 901, gr. d. Rosetta of Sidney by Paddy, 899.

Heifer, Eve of Mapleton, fawn, bred by exhibitor; calved March 26, 1882, sire Gold Finder, 2225, dam Cream of Sidney by Noble, 901 gr. d. Rosetta of Sidney by Paddy, 899.

Jersey Bulls, over Three Years Old.

B. G. Foster, Verona, N. Y.; first prize, fifty dollars; Milkmaid's Byron 2d, gray, bred by H. B. Curran, Whitestown, N. Y.; calved April 13, 1881, sire Milkmaid's Byron, 4269, dam Xenia by Norwood, 1077, gr. d. Joey 2d by Ossipee, 697.

John D. Wing, Millbrook, N. Y.; second prize, twenty-five dollars; Golden Cloud, dark gray, bred by H. Blampied, Trinity, Jersey; calved December 18, 1880, imported April 8, 1883, by exhibitor; sire Cetewayo (P. S. 224), dam Silver Cloud by Welcome (F. S., 172).

Jersey Bulls, Two Years Old.

L. L. Tozier, Batavia, N. Y.; first prize, forty dollars; Clotaire, dark fawn, calved April 19, 1882; imported in dam Floribunda 2d, August 20, 1881, by Cooper, Maddux & Co., Reading, Ohio; sire Royal Oak, 6219.

Edward L. Clarkson, Tivoli, N. Y.; second prize, twenty dollars; Young Duke of Darlington, steel gray, bred by W. A. Mullin, Mount Holly Springs, Penn.; calved February 8, 1882, sire Duke of Darlington, 2460, dam Lady Vermont by Noble 2d (F. S. 256), gr. d. Miss Vermont, imported in 1878.

Jersey Bulls, One Year Old.

C. V. Strait, Sylvania, Penn.; first prize, thirty dollars; Jerry of Hilldale, dark fawn, bred by P. F. Bellinger, Herkimer, N. Y.; calved March 24, 1883, sire Drimo, 7182, dam Rose Alphea by Oliver, 838, gr. d. Rozia by Clifton, 6.

Alvin Devereux, Deposit, N. Y.; second prize, fifteen dollars; Gold Prize, dark fawn, bred by William S. Taylor, Burlington, N. J.; calved March, 1883, sire Gilderoy 2d, 4037, dam Miss Willis Jones by Mopsus, 1165, gr. d. Bronx Pearl by Kearsage, 257.

Jersey Bull Calves.

David Menzie, Caledonia, N. Y.; first prize, ten dollars; Primrose Carlo, dark fawn, bred by Theodore A. Havemeyer, Mahwah, N. J.; calved October 26, 1883, sire Carlo, 5559, dam Primrose, imported September 9, 1880, by T. A. Havemeyer.

George Sidney Camp, Owego, N. Y.; second prize, five dollars; Mollies' Favorite, smoky gray, bred by exhibitor; calved December 17, 1883, sire Favorite Pansy Rex, 5678, dam Mollie Oaks, imported in 1870.

Jersey Cows, over Three Years Old.

A. Baker, West Dryden, N. Y.; first prize, forty dollars; Cream of Sidney, fawn, bred by Joseph Sweet, Unadilla, N. Y.; calved March 4, 1876, sire Noble, 901, dam Rosetta of Sidney by Paddy, 899, gr. d. Dahlia of Babylon, imported in 1871.

Edward L. Clarkson, Tivoli, N. Y.; second prize, twenty dollars; Chœpeta, orange fawn, bred by W. A. Conover, Hackettstown, N. J.; calved May, 1879, sire Prince of Warren, 1512, dam Tamy 2d by Optimus, 1607, gr. d. Tamy by Optimus, 1607.

Jersey Heifers, Two Years Old.

Houghton Farm, Mountainville, N. Y.; first prize, thirty dollars; Mrs. Langtry, fawn, bred by F. Alexander, Grouville, Jersey; calved December 30, 1881, imported in dam, August 3, 1881, by W. R. McCready, Saugatuck, Conn., sire Snap 2d (P. S. 293), dam Tulip by Welcome (F. S. 202).

T. R. Proctor, Utica, N. Y.; second prize, fifteen dollars; Clasp, solid color, bred by John D. Wing, Millbrook, N. Y.; calved March 11, 1882, sire Dedo's Duke, 4678, dam Corinna 4th by Brown Duke, 2190, gr. d. Corinna by Mogul, 532.

Jersey Heifers, One Year Old.

H. W. Skeritt, Deansville, N. Y.; first prize, twenty dollars; Princess Rajah, fawn, bred by H. B. Curran, Whitestone, N. Y.; calved March 5, 1883, sire Young Rajah, 5810, dam Xenia by Norwood, 1077, g. d. Joey 2d by Ossipee, 697.

John D. Wing, Millbrook, N. Y.; second prize, ten dollars; Golden Hope, dark gray, bred by J. J. DeGruchy, Trinity, Jersey; calved February 6, 1883, imported by exhibitor in 1883, sire Golden Cloud, 9481.

Jersey Heifer Calves.

Houghton Farm, Mountainville, N. Y.; first prize, ten dollars; Lily Le Bicton, fawn, bred by exhibitor; calved December 19, 1883, sire Ramapo, 4679, dam Mrs. Langtry by Snap 2d (P. S. 293, J. H. B.), gr. d. Tulip by Welcome (F. S. 202).

L. L. Tozier, Batavia, N. Y.; second prize, five dollars; Floribundus Perfection, fawn, bred by David Menzie, Caledonia, N. Y.; calved December 10, 1883, sire Clotaire, 9884, dam Lady Bingo by Bingo 2d, 6749, gr. d. Mrs. Knickerbocker by Bingo, 1811.

GUERNSEYS.

Guernsey Herd Prize.

L. W. Ledyard, Cazenovia, N. Y.; large gold medal.

Bull, Sir Fernwood, orange fawn and white, bred by exhibitor; calved May 8, 1882, sire Fernwood, 190, dam Elegante, imported by Samuel C. Kent in 1880.

Cow, Maiden Hair, orange fawn and white, bred by John Bisson, The Vale, Guernsey; calved April, 1878, imported by exhibitor in 1880.

Cow, Myra of Fernwood, fawn and white, bred by H. Ogier, Vale Parish, Guernsey; calved 1879, imported by exhibitor in 1883.

Cow, Fern Leaf, lemon fawn and white, bred by exhibitor; calved February 13, 1881, sire Fernwood, 190, dam Kathleen, imported by C. M. Beach, Hartford, Conn., in 1877.

Cow, Irene, lemon fawn and white, bred by Augustus Ward, Farmington, Conn.; calved May 11, 1881, sire Coronet, 149, dam Victorine 3d by Prince, 17, gr. d. Victorine, imported by M. C. Weld in 1876.

Heifer, Belle of Fernwood, light fawn and white, bred by Nicholas Le Pelley, Guernsey; calved November 3, 1882, imported by exhibitor in 1883, sire Lord Fernwood, 644.

Guernsey Bulls, over Three Years Old.

James Lawrence, Groton, Mass.; first prize, fifty dollars; Hotspur, brown fawn, bred by exhibitor; calved July, 1881, sire Sam, 159, dam Pomona, imported by Simon Beattie in 1878.

Nutting Brothers, Woodville, N. Y.; second prize, twenty-five dollars; Og, fawn and white, bred by E. Norton, Farmington, Conn.; calved April 19, 1878, sire Mallbrook, 23, dam Princess, imported by M. C. Weld in 1876.

Guernsey Bulls, Two Years Old.

L. W. Ledyard, Cazenovia, N. Y.; first prize, forty dollars; Sir Fernwood, orange fawn and white, bred by exhibitor; calved May 8, 1882, sire Fernwood, 190, dam Elegante, imported by Samuel C. Kent in 1880.

James Lawrence, Groton, Mass.; second prize, twenty dollars; Timour, lemon fawn, bred by John Langlois, St. Peters-in-the-Wood, Guernsey; calved February, 1882.

Guernsey Bulls, One Year Old.

L. W. Ledyard, Cazenovia, N. Y.; first prize, thirty dollars; Fancy's Lady, lemon fawn and white, bred by exhibitor; calved June 9, 1883, sire Fernwood Chief, 316, dam Fernwood Fancy, imported by C. M. Beach, Hartford, Conn., in 1877.

Nutting Brothers, Woodville, N. Y.; second prize, fifteen dollars; Ontario, fawn and white, bred by Thomas M. Harvey & Son, West Grove, Penn.; calved August 16, 1883, sire Carey of Guernsey, 349, dam Nancy 2d by Sir Champion, 38, gr. d. Nancy, imported by P. H. Fowler, Watford, Herts, England, in 1869.

Guernsey Bull Calves.

James Lawrence, Groton, Mass.; first prize, ten dollars; Babbitassett, lemon fawn, bred by exhibitor; calved December, 1883; sire Duke of Groton, 665, dam Groton Bouncer, imported by C. M. Beach, Hartford, Conn., in 1877.

L. W. Ledyard, Cazenovia, N. Y.; second prize, five dollars; Florio, orange red and white, bred by exhibitor; calved October 13, 1883, sire Fernwood Chief, 316, dam Kathleen, imported by C. M. Beach, Hartford, Conn., in 1877.

Guernsey Cows, over Three Years Old.

L. W. Ledyard, Cazenovia, N. Y.; first prize, forty dollars; Myra of Fernwood, fawn and white, bred by H. Ogier, Vale Parish, Guernsey; calved 1879, imported by exhibitor in 1883.

James Lawrence, Groton, Mass.; second prize, twenty dollars; Tattle, lemon, bred by Nico Torode, Guernsey; calved 1873, imported in 1877.

Guernsey Heifers, Two Years Old.

L. W. Ledyard, Cazenovia, N. Y.; first prize, thirty dollars; Jenny of Fernwood, lemon fawn and white, bred by D. O. Le Patourel, St. Sampson's, Guernsey; calved November, 1881, imported by exhibitor in 1883, sire Royal George, 120.

George La Monte, Bound Brook, N. J.; second prize, fifteen dollars; Silver 2d, red and white, calved September 26, 1881, imported in dam Silver by A. M. Herkness & Co., Philadelphia, Penn.

Guernsey Heifers, One Year Old.

George La Monte, Bound Brook, N. J.; first prize, twenty dollars; Bessie of Lehigh 2d, orange and white, bred by Thomas Falla, St. Sampson's, Guernsey; calved August, 1883, sire Aquilon, 111.

A. S. Shriver, Reddington, Penn.; second prize, ten dollars; Apple Peel, fawn, bred by exhibitor; calved April 15, 1883, sire King of Central Park Fruit and Stock Farm, 304, dam Mertie by Napoleon, 58, gr. d. Nancy 2d by Sir Champion, 38.

Guernsey Heifer Calves.

L. W. Ledyard, Cazenovia, N. Y.; first prize, ten dollars; Glenwood Girl, lemon fawn and white, bred by Nicholas B. Robin, Hougette Farm, Guernsey; calved February 7, 1884, imported in dam Gazelle of Fernwood by exhibitor, sire Meteor (181).

George La Monte, Bound Brook, N. J.; second prize, five dollars; Honeydew's daughter, orange fawn and white, bred by John Davey, St. Peter's Port, Guernsey; calved September 22, 1883, sire Lord Strathallen (29), dam Honeydew 2d.

MILCH COWS.

Smiths & Powell, Syracuse, N. Y.; first prize, thirty dollars; Holstein cow, Netherland Baroness, black and white, bred by Jan Vander Meer, Beemster, North Holland; calved March 15, 1877, imported by exhibitor in 1882.

Smiths & Powell, Syracuse, N. Y.; second prize, fifteen dollars; Holstein cow, Netherland Duchess, black and white, bred by A. C. Koning, Beemster, North Holland; calved March 30, 1878, imported by exhibitor in 1879.

OXEN, STEERS AND FAT CATTLE.

Fat Oxen, over Four Years Old.

H. J. Cranston, Sheridan, N. Y.; first prize, thirty dollars; grade Shorthorn.

Fat Steers, under Four Years Old.

H. J. Cranston, Sheridan, N. Y.; first prize, thirty dollars; grade Shorthorn.

Fat Cows, over Four Years Old.

H. J. Cranston, Sheridan, N. Y.; first prize, thirty dollars; grade Shorthorn.

W. C. Albertson, Rush, N. Y.; second prize, fifteen dollars; Duchess of Geneva (Shorthorn), red and white, bred by exhibitor; calved October 1, 1879, sire Geneva Duke, 11209, dam Buttercup 2d by Victor, 11104, gr. d. Buttercup by General Sigel, 8211.

Fat Heifers, under Four Years Old.

H. J. Cranston, Sheridan, N. Y.; first prize, thirty dollars; grade Shorthorn.

Pairs of Working Oxen, over Three Years Old.

John Arnot, Jr., Elmira, N. Y.; first prize, thirty dollars; black and white, 6 years.

W. T. Post, Elmira, N. Y.; second prize, fifteen dollars; red and white, years.

EXTRA STOCK.

NORFOLK AND SUFFOLK RED POLLED.

Herd Prize.

G. F. Taber, Patterson, N. Y.; large gold medal.

Bull, Francillo, bred by J. J. Colman, Norfolk, England; calved January 13, 1882, sire Charles (469), dam Fan by Roundhead (180), gr. d. Fanny by Hero 3d (87).

Cow, Tillie, bred by exhibitor; calved June 24, 1878, sire Champion (271), dam Theresa by Sampson (192), gr. d. Gwinny, by Hero 3d (87).

Cow, Rose, bred by W. Bradfield, Norfolk, England; calved September, 1878, sire Redhead (552), dam Cherry by Fransham Captain (71), gr. d. Tit by Necton 3d (122).

Cow, Pond Lilly 2d, bred by J. Rivett, Norfolk, England; calved July 1880, sire Falstaff (303).

Heifer, Lucretia, bred by exhibitor; calved September 18, 1881, sire Champion (271), dam Ravenwood Lass by Robin (176), gr. d. Nelly by Hero 2d (86).

Heifer, Christina 2d, bred by exhibitor; calved February 6, 1882, sire Champion (271), dam Christina by Rufus (188), gr. d. Cauliflower 3d by Shylock (196).

HORSES.

BREEDING AND GROWING STOCK.

Second Prize for the best pure bred Draught Stallion of any age or breed, large gold medal.

Orrin W. Todd, Rochester, N. Y.; Young Marquis 2d (Clydesdale), dark chestnut, 16.3, 9 years, sire Young Marquis, dam by Masterman, gr. d. by Jack's Alive.

CLYDESDALES.

Stallions, over Four Years Old.

Orrin W. Todd, Rochester, N. Y.; first prize, fifty dollars; Lord Clyde, brown, 17.2, 7 years, sire Lord Clyde, dam Darling by Sterling, gr. d. by Netherby.

Orrin W. Todd, Rochester, N. Y.; second prize, twenty-five dollars; Young Marquis 2d, dark chestnut, 16.3, 9 years, sire Young Marquis, dam by Masterman, gr. d. by Jack's Alive.

Stallions, Three Years Old.

Rumsey Brothers, Westfield, N. Y.; first prize, forty dollars; Farmer Tom, brown, foaled May 4, 1881, bred by George Hull, Schonberg, Ont.; sire What's Wanted, 622, dam Nell by Highland Chief, 226, gr. d. by Sir Walter Scott, 210.

T. C. Wright, Logan, N. Y.; second prize, twenty dollars; Admiral, bay, 16.2, bred by A. Ross, Greenbank, Ont.; foaled May, 1881, sire Gleniffer, dam by Netherby, gr. d. by imported Robin Hood.

Stallions, Two Years Old.

A. P. Cook, Binghamton, N. Y.; first prize, thirty dollars; Ontario Chief, black, 16.1, bred by Marmaduke Laidman, Binbrook, Ontario; foaled November 22, 1881, sire imported Nonesuch II, dam by Prince Alfred, gr. d. by Indian Chief.

PERCHERONS.

Stallions, over Four Years Old.

John W. Aikin, Scipio, N. Y.; first prize, fifty dollars; Genator, dapple bay, 16.3, 6 years, imported by exhibitor in 1883.

Elwood S. Aikin, Scipio, N. Y.; second prize, twenty-five dollars; Revier, white, 16.3, 7 years, imported by John W. Aikin in 1883.

Stallions, Three Years Old.

Elwood S. Aikin, Scipio, N. Y.; first prize, forty dollars; Laurent, dark gray, 16.2, imported by J. W. Aikin in 1883.

E. A. Cottrell, Andover, N. Y.; second prize, twenty dollars; Phillisides, dark gray, 15.3, bred by M. Periott, Nogent-le-Rotrou, France; sire Narbonne.

Stallions, Two Years Old.

Elwood S. Aikin, Scipio, N. Y.; first prize, thirty dollars; Dude, dark gray, imported by J. W. Aikin, in 1883.

John W. Aikin, Scipio, N. Y.; second prize, fifteen dollars; black, imported by exhibitor.

Stallions, One Year Old.

Elwood S. Aikin, Scipio, N. Y.; first prize, twenty dollars; Bravo, black, imported by J. W. Aikin in 1883.

John W. Aikin, Scipio, N. Y.; second prize, ten dollars; gray, imported by exhibitor.

Mares, over Four Years Old.

Elwood S. Aikin, Scipio, N. Y.; first prize, forty dollars; Mignonette, gray, eight years, imported by J. W. Aikin.

John W. Aikin, Scipio, N. Y.; second prize, twenty dollars; Patience, light dapple gray, 16.2, five years, imported by exhibitor.

Fillies, Three Years Old.

Frank B. Redfield, Batavia, N. Y.; first prize, thirty dollars; Nathalie, dark gray, imported by M. W. Dunham, Wayne, Ill.

John W. Aikin, Scipio, N. Y.; second prize, fifteen dollars; black, 16, imported by exhibitor.

Fillies, Two Years Old.

John W. Aikin, Scipio, N. Y.; first prize, twenty dollars; bay, imported by exhibitor.

Fillies, One Year Old.

John W. Aikin, Scipio, N. Y.; first prize, fifteen dollars; Monica, dark gray, imported by exhibitor.

Elwood S. Aikin, Scipio, N. Y.; second prize, five dollars; Ion, gray, 15, imported by John W. Aikin.

COACHERS.

Stallions, over Four Years Old.

Shepard & Peer, Mt. Morris, N. Y.; first prize, fifty dollars; Baronet, dark bay, 16.2, eight years, sire Emperor, dam by Herod, gr. d. by General Jackson.

George E. Harris, Elmira, N. Y.; second prize, twenty-five dollars; black, 16.2, seven-eighths Percheron.

Stallions, Three Years Old.

Shepard & Peer, Mt. Morris, N. Y.; first prize, forty dollars; Royal Prince, brown, 16.3½, sire Young Emperor, dam Progress by Old Cleveland.

ROADSTERS.

Including Messengers of all branches, Clays, Morgans, Coachers and all families founded upon, or more or less improved by, English or Eastern blood.

Special Prize for the Best Stallion of any Age.

B. F. Tracy, Apalachin, N. Y.; large gold medal; Mambrino Dudley, bay, 15.3, ten years, bred by A. J. Alexander, Woodburn, Ky.; sire Woodford Mambrino, dam Sue Dudley by Edwin Forrest, gr. d. Madam Dudley by a Bashaw horse.

Stallions, over Five Years Old.

Theodore Coleman, Sheldrake, N. Y.; first prize, seventy dollars; Seneca Chief, bay, 15.2½, twenty years, bred by Wm. Jordan, Bullville, N. Y.; sire Rysdyk's Hambletonian, dam Lady Jordan by Young Hector, gr. d. by Walden Messenger.

B. F. Tracy, Apalachin, N. Y.; second prize, thirty-five dollars; Mambrino Dudley, bay, 15.3, ten years, bred by A. J. Alexander, Woodburn, Ky.; sire Woodford Mambrino, dam Sue Dudley by Edwin Forrest, gr. d. Madam Dudley by a Bashaw horse.

Stallions, Four Years Old.

Nathan Case, Egypt, N. Y.; first prize, sixty dollars; Young Tremont, bay, 16, bred by exhibitor; foaled, May 18, 1880, sire Little's Fremont, dam by Young Consternation, gr. d. by One-eyed Norman.

Charles Fink, Jr., Lyons, N. Y.; second prize, thirty dollars; Wayne Chief, bay, 16.3, bred by David McKnutt, Palmyra, N. Y.; foaled May 11, 1880, sire Tremont, dam Jennie by Old Royal George, gr. d. Fannie, imported from England.

Stallions, Three Years Old.

D. G. Hills, Sidney Plains, N. Y.; first prize, fifty dollars; Early Bird, bay, 15.2, bred by exhibitor; sire Victor Jr., dam Maggie Clark by Owego Chief.

D. G. Hills, Sidney Plains, N. Y.; second prize, twenty-five dollars; Pickwick, black, 15.2, bred by exhibitor; sire Henry Hill, dam Blackbird by Cloud (son of Hill's Black Hawk), gr. d. by Old Abdallah.

Stallions, Two Years Old.

Nathan Eldridge, Smyrna, N. Y.; first prize, forty dollars; Happy Prince, bay, bred by exhibitor; sire Parson's Happy Prince, dam Lady Clark by Brainard.

William Kimball, Mitchell Creek, N. Y.; second prize, twenty dollars; iron gray.

Stallions, One Year Old.

B. F. Tracy, Apalachin, N. Y.; first prize, thirty dollars; Crescent, chestnut, bred by exhibitor; foaled April 14, 1883, sire Mambrino Dudley, dam Megenna by Wedgewood, gr. d. Bicari by Harold.

B. F. Tracy, Apalachin, N. Y.; second prize, fifteen dollars; Staunton, brown, bred by exhibitor; foaled May 11, 1883, sire Mambrino Dudley, dam Lady Herr by Mambrino Pilot, gr. d. Myrtle by Consternation.

Mares, Over Four Years Old.

Josiah P. Davis, Savona, N. Y.; first prize, fifty dollars; Bell Davis, light bay, 15.1, five years.

John Stroase, Southport, N. Y.; second prize; twenty-five dollars; iron gray, 15.8, five years.

Fillies, Three Years Old.

Thomas Ellis, Reading Centre, N. Y.; first prize, forty dollars; chestnut, 15.2.

D. C. Strait, Sylvania, Penn.; second prize, twenty dollars, Oaklona, black, bred by exhibitor.

Fillies, Two Years Old.

Thomas S. Flood, Elmira, N. Y.; first prize, thirty dollars; Edith F., bay, bred by exhibitor; sire King Almont, dam Mary Ann by Magnolia, gr. d. by McConnell's Champion.

Fillies, One Year Old.

B. F. Tracy, Apalachin, N. Y.; first prize, twenty dollars; Chicory, bay, bred by exhibitor; foaled March 20, 1883, sire Mambrino Dudley, dam Emilia by Rysdyk's Hambletonian, gr. d. Lady Bellfounder by Webber's Tom Thumb.

Lafayette Baily, Caton Centre, N. Y.; second prize, ten dollars; sire Independence, dam by Townsend's Bellfounder.

SHETLAND PONIES.

Stallions, over Two Years Old.

G. M. Wood, Woodville, N. Y.; first prize, twenty dollars; Dexter black, 10, eleven years, imported.

J. F. Converse, Woodville, N. Y.; second prize, ten dollars; black, 10, thirteen years, bred by exhibitor.

Stallions, under Two Years Old.

J. F. Converse, Woodville, N. Y.; first prize, fifteen dollars; black, one year, bred by exhibitor.

Mares, over Two Years Old.

J. F. Converse, Woodville, N. Y.; first prize, twenty dollars; Minnie, black, 9.2, six years, bred by exhibitor.

J. F. Converse, Woodville, N. Y.; second prize, ten dollars; Clara, black, 10, seven years, bred by exhibitor.

HARNESS AND SADDLE HORSES.

Draught Pairs.

John W. Akin, Scipio, N. Y.; first prize fifty dollars; Percheron mares, imported by exhibitor; Adelaide gray, six years, and Empress, black, four years.

Henry Tubbs, Osceola, Penn.; second prize, twenty-five dollars; gray stallions, 16.2, four years.

Coach Pairs.

L. Hughley, Watkins, N. Y.; first prize, fifty dollars; brown geldings, 16, six and seven years, bred by exhibitor.

Dewitt C. Munger, Castile, N. Y.; second prize, twenty-five dollars; bay geldings, 16, seven years.

Phæton Pairs.

C. W. Cooper, Elmira, N. Y.; first prize, fifty dollars; bay geldings, 15.2½ and 15.3½, five years, sire Cuyler (son of Rysdyk's Hambletonian).

A. C. Sherman, Penn Yan, N. Y.; second prize, twenty-five dollars; chestnut, 15.2, seven and eight years.

Coupé Horses.

A. L. Thomas, Cuba, N. Y.; first prize, thirty dollars; light bay gelding, 16.1, six years.

A. W. Smith, Cuba, N. Y.; second prize, fifteen dollars; Paul, brown gelding, 16.2, bred by exhibitor; foaled June 15, 1878, sire Gibson, dam by Wood's Hambletonian.

Roadsters.

R. M. Bingham, Rome, N. Y.; first prize, thirty dollars; bay gelding, 15.3, four years.

David B. Thomas, Owego, N. Y.; second prize, fifteen dollars; bay mare, 15.2, five years.

Saddle Horses.

R. M. Bingham, Rome, N. Y.; first prize, thirty dollars; chestnut gelding, 15.2, five years.

R. M. Bingham, Rome, N. Y.; second prize, fifteen dollars; bay gelding, 16, four years.

Ponies (under 13 hands) Broken to Harness or Saddle.

J. F. Converse, Woodville, N. Y.; first prize, twenty dollars; bay mare, 12.2, bred by exhibitor.

A. W. Smith, Cuba, N. Y.; second prize. ten dollars; Stub, brown gelding, 9.3, three years, Shetland.

JACKS AND MULES.

JACKS.

Henry Burnett, Logan, N. Y.; first prize, thirty dollars; Don Juan, dark-brown, 14.8, eight years.

William Sickels, Elmira, N. Y.; second prize, fifteen dollars, black, 11, three years.

SHEEP, SWINE AND POULTRY.

LONG WOOLED SHEEP — LEICESTERS.

Rams, One Year Old.

W. S. Moore, Mt. Upton, N. Y.; first prize, twenty dollars; bred by John Clark, Delhi, N. Y.

Ram Lambs.

W. S. Moore, Mt. Upton, N. Y.; first prize, ten dollars; bred by exhibitor.

Pens of Ewes, over Two Years Old.

W. S. Moore, Mt. Upton, N. Y.; first prize, twenty dollars; two years, bred by John Clark, Delhi, N. Y.

Pens of Ewe Lambs.

W. S. Moore, Mt. Upton, N. Y.; first prize, ten dollars; bred by exhibitor.

COTSWOLDS.

Rams, over Two Years.

Shepard & Peer, Mt. Morris, N. Y.; first prize, twenty dollars; two years, bred by Charles Barton, England.

George Chick, Attica, N. Y.; second prize, ten dollars; bred by J. C. Ross.

Rams, One Year Old.

George Chick, Attica, N. Y.; first prize, twenty dollars; bred by exhibitor.

Ram Lambs.

George Chick, Attica, N. Y.; first prize, ten dollars; bred by exhibitor.

George Chick, Attica, N. Y.; second prize, five dollars; bred by exhibitor.

Pens of Ewes, over Two Years Old.

Shepard & Peer, Mt. Morris, N. Y.; first prize, twenty dollars; aged, bred by Jacobs & Barton, England.

George Chick, Attica, N. Y.; second prize, ten dollars; bred by exhibitor.

Pens of Yearling Ewes.

George Chick, Attica, N. Y.; first prize, twenty dollars; bred by exhibitor.

Shepard & Peer, Mt. Morris, N. Y.; second prize, ten dollars; bred by F. S. Peer.

Pens of Ewe Lambs.

Aaron Bordwell, Corfu, N. Y.; first prize; ten dollars; bred by exhibitor.

George Chick, Attica, N. Y.; second prize, five dollars; bred by exhibitor.

LINCOLNS.

Rams, over Two Years Old.

G. W. & O. Johnson, Geneva, N. Y.; first prize, twenty dollars.

Ram Lambs.

G. W. & O. Johnson, Geneva, N. Y.; first prize, ten dollars.

Pens of Ewes, over Two Years Old.

G. W. & O. Johnson, Geneva, N. Y.; first prize, twenty dollars.

Pens of Yearling Ewes.

G. W. & O. Johnson, Geneva, N. Y.; first prize, twenty dollars.

Pens of Ewe Lambs.

G. W. & O. Johnson, Geneva, N. Y.; first prize, ten dollars.

MIDDLE-WOOLED SHEEP — SOUTHDOWNS.

Rams, over Two Years Old.

John Hobart Warren, Hoosick Falls, N. Y.; first prize, twenty dollars; bred by exhibitor.

John Hobart Warren, Hoosick Falls, N. Y.; second prize, ten dollars; bred by exhibitor.

Rams, One Year Old.

D. B. Haight, Dover Plains, N. Y.; second prize, ten dollars.

Ram Lambs.

D. B. Haight, Dover Plains, N. Y.; first prize, ten dollars.

John Hobart Warren, Hoosick Falls, N. Y.; second prize, five dollars.

Pens of Ewes, over Two Years Old.

D. B. Haight, Dover Plains, N. Y.; first prize, twenty dollars.

D. B. Haight, Dover Plains, N. Y.; second prize, ten dollars.

Pens of Yearling Ewes.

D. B. Haight, Dover Plains, N. Y.; first prize, twenty dollars.

John Hobart Warren, Hoosick Falls, N. Y.; second prize, ten dollars; bred by Lord Walsingham.

Pens of Ewe Lambs.

D. B. Haight, Dover Plains, N. Y.; first prize, ten dollars.

John Hobart Warren, Hoosick Falls, N. Y.; second prize, five dollars; bred by exhibitor.

SHROPSHIRES.

Rams, over Two Years Old.

C. D. Smead, Logan, N. Y.; first prize, twenty dollars; Duke of Affington, bred by John Evans, Affington, England, sire May Duke by Grand Duke, dam by Royal Taunton.

James Lawrence, Groton, Mass.; second prize, ten dollars.

Rams, One Year Old.

E. B. Hawks, Wells' Bridge, N. Y.; second prize, ten dollars.

Ram Lambs.

C. D. Smead, Logan, N. Y.; first prize, ten dollars; Highlander, bred by Henry Lovett, England, sire Highland Chief, dam Mary's Pet.

C. D. Smead, Logan, N. Y.; second prize, five dollars; Chieftain, bred by exhibitor, sire Royal Gem, dam Maggie Miller, imported.

Pens of Ewes, over Two Years Old.

C. D. Smead, Logan, N. Y.; first prize, twenty dollars; Cora and Orietta, bred by John Evans, England; Fashion, bred by Richard Thomas, Baschurch, England.

Pens of Yearling Ewes.

C. D. Smead, Logan, N. Y.; first prize, twenty dollars; Duett, Capitola, and Lorette, bred by exhibitor, sire Victor, imported, dams imported.

Pens of Ewe Lambs.

E. B. Hawks, Wells' Bridge, N. Y.; second prize, five dollars.

HAMPSHIRES.

Rams, over Two Years Old.

E. M. Benham, Hopewell Centre, N. Y.; first prize, twenty dollars; imported.

W. C. & L. P. Smith, Penn Yan, N. Y.; second prize, ten dollars; bred by exhibitor.

Rams, One Year Old.

E. M. Benham, Hopewell Centre, N. Y.; first prize, twenty dollars; bred by exhibitor.

James Wood, Mt. Kisco, N. Y.; second prize, ten dollars; imported in ewe from flock of George Palmer, M. P., Berkshire, England.

Ram Lambs.

James Wood, Mt. Kisco, N. Y.; first prize, ten dollars; bred by exhibitor.

James Wood, Mt. Kisco, N. Y.; second prize, five dollars; bred by exhibitor.

Pens of Ewes, over Two Years Old.

James Wood, Mt. Kisco, N. Y.; first prize, twenty dollars; bred by John King of Beedon, near Newburg, England, imported in 1882.

E. M. Benham, Hopewell Centre, N. Y.; second prize, ten dollars; bred by Eugene Ham.

Pens of Yearling Ewes.

James Wood, Mt. Kisco, N. Y.; first prize, twenty dollars; imported in ewes from flock of George Palmer, M. P., Berkshire, England.

E. M. Benham, Hopewell Centre, N. Y.; second prize, ten dollars; bred by exhibitor.

Pens of Ewe Lambs.

James Wood, Mt. Kisco, N. Y.; first prize, ten dollars; bred by exhibitor.

E. M. Benham, Hopewell Centre, N. Y.; second prize, five dollars; bred by exhibitor.

OXFORDSHIRES.

Rams, One Year Old.

Aaron Bordwell, Corfu, N. Y.; first prize, twenty dollars; 2d Duke of Oxford, bred by Charles Johnson, Busti, N. Y.

Ram Lambs.

Aaron Bordwell, Corfu, N. Y.; first prize, ten dollars.

Pens of Ewe Lambs.

Aaron Bordwell, Corfu, N. Y.; first prize, ten dollars.

FINE-WOOLED SHEEP — MERINOS, BRED FOR FINENESS OF WOOL.

Rams, over Three Years Old.

C. D. & C. Kenyon, Centre White Creek, N. Y.; first prize, twenty dollars; bred by Carl Heyne.

Warren J. Tyler, South Byron, N. Y.; second prize, ten dollars; bred by H. C. James.

Rams, Two Years Old.

E. Townsend & Sons, Pavilion Centre, N. Y.; first prize, twenty dollars.

Warren J. Tyler, South Byron, N. Y.; second prize, ten dollars; bred by exhibitor.

Rams, One Year Old.

Howard Tryon, Fleming, N. Y.; first prize, twenty dollars.

Warren J. Tyler, South Byron, N. Y.; second prize, ten dollars; bred by exhibitor.

Ram Lambs.

Warren J. Tyler, South Byron, N. Y.; first prize, ten dollars; bred by exhibitor.

E. Townsend & Sons, Pavilion Centre, N. Y.; second prize, five dollars.

Pens of Ewes, over Three Years Old.

E. Townsend & Sons, Pavilion Centre, N. Y.; first prize, twenty dollars.

C. D. & C. Kenyon, Centre White Creek, N. Y.; second prize, ten dollars; bred by Carl Heyne.

Pens of Ewes, Two Years Old.

Warren J. Tyler, South Byron, N. Y.; first prize, twenty dollars; bred by exhibitor.

C. D. & C. Kenyon, Centre White Creek, N. Y.; second prize, ten dollars; bred by Carl Heyne.

Pens of Yearling Ewes.

C. D. & C. Kenyon, Centre White Creek, N. Y.; first prize, twenty dollars; bred by exhibitors.

Pens of Ewe Lambs.

Warren J. Tyler, South Byron, N. Y.; first prize, ten dollars; bred by exhibitor.

C. D. & C. Kenyon, Centre White Creek, N. Y.; second prize, five dollars; bred by exhibitors.

MERINOS, BRED FOR WEIGHT OF FLEECE.

Rams, over Three Years Old.

Ray Brothers, Hemlock Lake, N. Y.; first prize, twenty dollars; Prince Bismarck.

George W. Ostrander, Hoosick Falls, N. Y.; second prize, ten dollars; bred by exhibitor.

Rams, Two Years Old.

Ray Brothers, Hemlock Lake, N. Y.; first prize, twenty dollars.

Julius Stickney, Wheeler, N. Y.; second prize, ten dollars.

Rams, One Year Old.

E. Townsend & Sons, Pavilion Centre, N. Y.; first prize, twenty dollars.

Ray Brothers, Hemlock Lake, N. Y.; second prize, ten dollars; Kaiser.

Ram Lambs.

Ray Brothers, Hemlock Lake, N. Y.; first prize, ten dollars; Randall.

George W. Ostrander, Hoosick Falls, N. Y.; second prize, five dollars.

Pens of Ewes, over Three Years Old.

E. Townsend & Sons, Pavilion Centre, N. Y.; first prize, twenty dollars.

Ray Brothers, Hemlock Lake, N. Y.; second prize, ten dollars.

Pens of Ewes, Two Years Old.

E. Townsend & Sons, Pavilion Centre, N. Y.; first prize, twenty dollars.

D. W. Percey, North Hoosick, N. Y.; second prize, ten dollars; bred by exhibitor.

Pens of Yearling Ewes.

Ray Brothers, Hemlock Lake, N. Y.; first prize, twenty dollars.

E. Townsend & Sons, Pavilion Centre, N. Y.; second prize, ten dollars.

Pens of Ewe Lambs.

Ray Brothers, Hemlock Lake, N. Y.; first prize, ten dollars.

L. J. Burgess, North Hoosick, N. Y.; second prize five dollars; sire Holmes Ram, 926.

MERINOS, BRED FOR LENGTH OF STAPLE.

Rams, over Three Years Old.

Warren J. Tyler, South Byron, N. Y.; first prize, twenty dollars.

Howard Tryon, Fleming, N. Y.; second prize, ten dollars.

Rams, Two Years Old.

Ray Brothers, Hemlock Lake, N. Y.; first prize, twenty dollars.

E. Townsend & Sons, Pavilion Centre, N. Y.; second prize, ten dollars.

Rams, One Year Old.

Howard Tryon, Fleming, N. Y.; first prize, twenty dollars.

S. B. James, Hoosick, N. Y.; second prize, ten dollars.

Ram Lambs.

E. Townsend & Sons, Pavilion Centre, N. Y.; first prize, ten dollars.

Ray Brothers, Hemlock Lake, N. Y.; second prize, five dollars.

Pens of Ewes, over Three Years Old.

E. Townsend & Sons, Pavilion Centre, N. Y.; first prize, twenty dollars.

Warren J. Tyler, South Byron, N. Y.; second prize, ten dollars; bred by exhibitor.

Pens of Ewes, Two Years Old.

D. W. Percey, North Hoosick, N. Y.; first prize, twenty dollars; bred by exhibitor.

Warren J. Tyler, South Byron, N. Y.; second prize, ten dollars, bred by exhibitor.

Pens of Yearling Ewes.

E. Townsend & Sons, Pavilion Centre, N. Y.; first prize, twenty dollars.

Julius Stickney, Wheeler, N. Y.; second prize, ten dollars.

Pens of Ewe Lambs.

Ray Brothers, Hemlock Lake, N. Y.; first prize, ten dollars.

S. B. James, Hoosick, N. Y.; second prize, five dollars; bred by exhibitor.

SWINE.

LARGE WHITE BREEDS.

Herd Prize.

A. L. Thomas, Cuba, N. Y.; gold medal.

Boars, over One Year Old.

Nutting Brothers, Woodville, N. Y.; first prize, twenty dollars; bred by E. J. Clark.

George H. Bell, Rome, N. Y.; second prize, ten dollars; Cheshire King, bred by T. R. Proctor, Utica, N. Y.

Boars, under One Year Old.

Thomas Brothers, Franklinville, N. Y.; first prize, twenty dollars.

A. L. Thomas, Cuba, N. Y.; second prize, ten dollars.

Sows, over One Year Old.

A. L. Thomas, Cuba, N. Y.; first prize, twenty dollars.

George H. Bell, Rome, N. Y.; second prize, ten dollars; Cheshire Queen, bred by T. R. Proctor, Utica, N. Y.

Sows, under One Year Old.

A. L. Thomas, Cuba, N. Y.; first prize, twenty dollars.

A. L. Thomas, Cuba, N. Y.; second prize, ten dollars.

POLAND CHINAS.

Herd Prize.

George H. Bell, Rome, N. Y.; gold medal.

Boars, over One Year Old.

George H. Bell, Rome, N. Y.: first prize, twenty dollars; Major B., bred by exhibitor.

John Bell, Lowell, N. Y.; second prize, ten pollars.; Prince of Lowell, bred by exhibitor.

Boars, under One Year Old.

George H. Bell, Rome, N. Y.; first prize, twenty dollars; General B., bred by exhibitor.

John Bell, Lowell, N. Y.; second prize, ten dollars; Jeddo, bred by . H. Bell.

Sows, over One Year Old.

George H. Bell, Rome, N. Y.; first prize, twenty dollars; Little Queen, bred by exhibitor.

George H. Bell, Rome, N. Y.; second prize, ten dollars; Flora B., bred by exhibitor.

Sows, under One Year Old.

George H. Bell, Rome, N. Y.; first prize, twenty dollars; Handsome 2d, bred by exhibitor.

John Bell, Lowell, N. Y.; second prize, ten dollars; Beauty, bred by G. H. Bell.

DUROC-JERSEYS.

Boars, over One Year Old.

Edward L. Clarkson, Tivoli, N. Y.; second prize, ten dollars; Prince of the Reds, bred by exhibitor; farrowed August 24, 1882, sire Prize Duke, 251, dam Princess Beatrice, 1016.

Sows, over One Year Old.

O. Howland & Son, Auburn, N. Y.; second prize, ten dollars; bred by exhibitors.

Sows, under One Year Old.

A. H. Moss, Wellsburg, N. Y.; second prize, ten dollars.

SMALL WHITE BREEDS.

Herd Prize.

T. R. Proctor, Utica, N. Y.; gold medal.

Boars, over One Year Old.

T. R. Proctor, Utica, N. Y.; first prize, twenty dollars; Lord Rinaldo, bred by exhibitor.

T. R. Proctor, Utica, N. Y.; second prize, ten dollars; Theodore, bred by B. Watson, Edmonton, Canada.

Boars, under One Year Old.

T. R. Proctor, Utica, N. Y.; first prize, twenty dollars; Proctor's Duke of New York, bred by exhibitor.

A. G. Chriswell, Adams' Basin, N. Y.; second prize, ten dollars; bred by exhibitor.

Sows, over One Year Old.

T. R. Proctor, Utica, N. Y.; first prize, twenty dollars; Sabrina, bred by exhibitor.

T. R. Proctor, Utica, N. Y.; second prize, ten dollars; Countess of Tilton, bred by Benj. Watson, Edmonton, Canada, sire Dick Turpin II, dam Lady Tilton III.

Sows, under One Year Old.

A. G. Chriswell, Adams' Basin, N. Y.; first prize, twenty dollars; Rose, bred by exhibitor.

T. R. Proctor, Utica, N. Y.; second prize, ten dollars; Sabrina Tilton, bred by exhibitor.

BERKSHIRES.

Herd Prize.

T. R. Proctor, Utica, N. Y.; gold medal.

Boars, over One Year Old.

T. R. Proctor, Utica, N. Y.; first prize, twenty dollars; Duke of York, bred by Wm. Pinnock, Hereford, England.

T. R. Proctor, Utica, N. Y.; second prize, ten dollars; Emperor III, bred by A. A. McArthur, Coburg, Canada.

Boars, under One Year Old.

T. R. Proctor, Utica, N. Y.; first prize, twenty dollars; Emperor IV, bred by J. Snell's Son's, Edmonton, Canada.

John Arnot, Jr., Elmira, N. Y.; second prize, ten dollars; bred by A. Bowen.

Sows, over One Year Old.

T. R. Proctor, Utica, N, Y.; first prize, twenty dollars; Dutchess of York, bred by Arthur Stewart's executors, Gloucester, England.

T. R. Proctor, Utica, N. Y.; second prize, ten dollars; Lucille Weston, bred by exhibitor.

Sows, under One Year Old.

T. R. Proctor, Utica, N. Y.; first prize, twenty dollars; Maybreeze Pearl, bred by exhibitor.

T. R. Proctor, Utica, N. Y.; second prize, ten dollars; Western Flower, bred by exhibitor.

ESSEX.

Boars, under One Year Old.

Houghton Farm, Mountainville, N. Y.; second prize, ten dollars; bred by exhibitor.

Sows, under One Year Old.

Houghton Farm, Mountainville, N. Y.; first prize, twenty dollars; bred by exhibitor.

POULTRY.

ASIATICS.

Light Brahmas.

James Seeley, Geneva, N. Y.; first prize, five dollars.

Jesse Lyon, Catherine, N. Y.; second prize, three dollars.

Dark Brahmas.

C. A. Ballou, Worcester, Mass.; first prize, five dollars.
C. A. Ballou, Worcester, Mass.; second prize, three dollars.

Partridge or Grouse Cochins.

H. A. Jones, Worcester, Mass.; first prize, five dollars.

White Cochins.

E. Delamarter, Elmira, N. Y.; first prize, five dollars.
E. Delamarter, Elmira, N. Y.; second prize, three dollars.

Langshans.

J. S. Hill, Elmira, N. Y.; first prize, five dollars.
Charles E. Dalrymple, Southport, N. Y.; second prize, three dollars.

DORKINGS.

Colored Dorkings.

H. A. Jones, Worcester, Mass.; first prize, five dollars.
O. Howland & Son, Auburn, N. Y.; second prize, three dollars.

Silver Gray Dorkings.

H. A. Jones, Worcester, Mass.; first prize, five dollars.
H. A. Jones, Worcester, Mass.; second prize, three dollars.

AMERICAN.

Plymouth Rocks.

Knapp Brothers, Fabius, N. Y.; first prize, five dollars.
Charles Swann, Elmira, N. Y.; second prize, three dollars.

Wyandottes.

Jones Wilcox, East Chatham, N. Y.; first prize, five dollars.
Jo es Wilcox, East Chatham, N. Y.; second prize, three dollars.

HAMBURGHS.

Golden Spangled Hamburgs.

Howland & Son, Auburn, N. Y.; first prize, five dollars.
& Son, Auburn, N. Y.; second prize, three dollars.

Silver Spangled Hamburgs.

Jo es Wilcox, East Chatham, N. Y.; first prize, five dollars.
O. Howland & Son, Auburn, N. Y.; second prize, three dollars.

Golden Penciled Hamburgs.

O. Howland & Son, Auburn, N. Y.; first prize, five dollars.

Silver Penciled Hamburgs.

O. Howland & Son, Auburn, N. Y.; first prize, five dollars.
H. A. Jones, Worcester, Mass.; second prize, three dollars.

Black Hamburgs.

E. A. Wendell, Albany, N. Y.; first prize, five dollars.
Charles E. Dalrymple, Southport, N. Y.; second prize, three dollars.

SPANISH.

Black Spanish.

H. W. Jessey, Elmira, N. Y.; first prize, five dollars.
E. A. Wendell, Albany, N. Y.; second prize, three dollars.

White Leghorns.

Knapp Brothers, Fabius, N. Y.; first prize, five dollars.
L. H. Waldorf, Elmira, N. Y.; second prize, three dollars.

Brown Leghorns.

Jones Wilcox, East Chatham, N. Y.; first prize, five dollars.
L. H. Waldorf, Elmira, N. Y.; second prize, three dollars.

Dominique Leghorns.

O. Howland & Son, Auburn, N. Y.; second prize, three dollars.

FRENCH.

Houdans.

Daniel Pinckney, South Onondaga, N. Y.; first prize, five dollars.
Daniel Pinckney, South Onondaga, N. Y.; second prize, three dollars.

POLISH.

Black Polish.

Charles E. Dalrymple, Southport, N. Y.; first prize, five dollars.
Charles E. Dalrymple, Southport, N. Y.; second prize, three dollars.

Silver Polish.

James Seeley, Geneva, N. Y.; first prize, five dollars.
A. L. Thomas, Cuba, N. Y.; second prize, three dollars.

GAMES.

Black-breasted Red Games.

Westervelt Haywood, Rutherford, N. Y.; first prize, five dollars.
O. Howland & Son, Auburn, N. Y.; second prize, three dollars.

Brown-breasted Red Games.

Westervelt Haywood, Rutherford, N. Y.; first prize, five dollars.

Silver Duckwing Games.

O. Howland & Son, Auburn, N. Y.; first prize, five dollars.
Fred. Webber, Syracuse, N. Y.; second prize, three dollars.

Yellow Duckwing Games.

James Seeley, Geneva, N. Y.; first prize, five dollars.

Red Pile Games.

Westervelt Haywood, Rutherford,; N. Y.; first prize, five dollars.

BANTAMS.

Red Game Bantams.

Westervelt Haywood, Rutherford, N. Y.; first prize, five dollars.
C. W. Canfield, Athens, Penn.; second prize, three dollars.

Red Pile Game Bantams.

H. A. Jones, Worcester, Mass.; first prize, five dollars.
H. A. Jones, Worcester, Mass.; second prize, three dollars.

White Pile Game Bantams.

H. A. Jones, Worcester, Mass.; first prize, five dollars.

Silver Duckwing Game Bantams.

O. Howland & Son, Auburn, N. Y.; first prize, five dollars.
Jones Wilcox, East Chatham, N. Y.; second prize, three dollars.

Yellow Duckwing Game Bantams.

O. Howland & Son, Auburn, N. Y.; first prize, five dollars.
Fred. S. Blessing, Slingerlands, N. Y.; second prize, three dollars.

Gold-laced Sebright Bantams.

E. A. Wendell, Albany, N. Y.; first prize, five dollars.
A. L. Thomas, Cuba, N. Y.; second prize, three dollars.

Black Bantams.

H. A. Jones, Worcester Mass.; first prize, five dollars.
H. A. Jones, Worcester, Mass.; second prize, three dollars.

Other Bantams.

H. A. Jones, Worcester, Mass.; first prize, five dollars; black game.
H. A. Jones, Worcester, Mass.; second prize, three dollars; black game.

TURKEYS, GEESE, DUCKS, ETC.

Bronze Turkeys.

C. B. Strait, Sylvania, Penn.; first prize, five dollars.
James Seeley, Geneva, N. Y.; second prize, three dollars.

White Turkeys.

O. Howland & Son, Auburn, N. Y.; first prize, five dollars.
James Seeley, Geneva, N. Y.; second prize, three dollars; Holland.

Pearl Guinea Fowls.

H. A. Jones, Worcester, Mass.; first prize, three dollars.
Fred. S. Blessing, Slingerlands, N. Y.; second prize, two dollars.

White Guinea Fowls.

O. Howland & Son, Auburn, N. Y.; first prize, three dollars.
E. Van Allen, Bethlehem Centre, N. Y.; second prize, two dollars.

Pea Fowls.

F. W. Hughson, Big Flats, N. Y.; first prize, three dollars.

Toulouse Geese.

James Seeley, Geneva, N. Y.; first prize, five dollars.
James Seeley, Geneva, N. Y.; second prize, three dollars.

Embden Geese.

Fred. S. Blessing, Slingerlands, N. Y.; first prize, five dollars.
George M. Ward, Elmira, N. Y.; second prize, three dollars.

White China Geese.

O. Howland & Son, Auburn, N. Y.; first prize, five dollars.
J. H. Webber, Big Flats, N. Y.; second prize, three dollars.

Brown China Geese.

Fred. S. Blessing, Slingerlands, N. Y.; first prize, five dollars.
Fred. S. Blessing, Slingerlands, N. Y.; second prize, three dollars.

Wild Geese.

O. Howland & Son, Auburn, N. Y.; first prize, five dollars.
Fred. S. Blessing, Slingerlands, N. Y.; second prize, three dollars.

Rouen Ducks.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, five dollars.
O. Howland & Son, Auburn, N. Y.; second prize, three dollars.

Cayuga Ducks.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, five dollars.

Muscovy Ducks.

H. A. Jones, Worcester, Mass.; first prize, five dollars.
L. H. Waldrof, Elmira, N. Y.; second prize, three dollars.

Pekin Ducks.

James Seeley, Geneva, N. Y.; first prize, five dollars.
O. Howland & Son, Auburn, N. Y.; second prize, three dollars.

PIGEONS.

Pouters.

Fred. S. Blessing, Slingerlands, N. Y.; second prize, two dollars.

Carriers.

H. A. Jones, Worcester, Mass.; first prize, three dollars.
Andrew P. Hall, Elmira, N. Y.; second prize, two dollars.

Tumblers.

Andrew P. Hall, Elmira, N. Y.; first prize, three dollars.
H. A. Jones, Worcester, Mass.; second prize, two dollars.

Barbs.

Andrew P. Hall, Elmira, N. Y.; first prize, three dollars.
H. A. Jones, Worcester, Mass.; second prize, two dollars.

Turbits, Solid Color.

H. A. Jones, Worcester, Mass.; first prize, three dollars.
H. A. Jones, Worcester, Mass.; second prize, two dollars.

Turbits, Winged.

H. A. Jones, Worcester, Mass.; first prize, three dollars.
Fred. S. Blessing, Slingerlands, N. Y.; second prize, two dollars.

Owls, Solid Color.

H. A. Jones, Worcester, Mass.; first prize, three dollars.
H. A. Jones, Worcester, Mass.; second prize, two dollars.

Fantails.

H. A. Jones, Worcester, Mass.; first prize, three dollars.
H. A. Jones, Worcester, Mass.; second prize, two dollars.

Jacobins.

Andrew P. Hall, Elmira, N. Y.; first prize, three dollars.
Andrew P. Hall, Elmira, N. Y.; second prize, two dollars.

Antwerps.

Austin Anderton, Elmira, N. Y.; first prize, three dollars.
Fred. S. Blessing, Slingerlands, N. Y.; second prize, two dollars.

Collections of Pouters.

Fred. S. Blessing, Slingerlands, N. Y.; second prize, three dollars.

Collections of Carriers.

Andrew P. Hall, Elmira, N. Y.; first prize, five dollars.

Collections of Tumblers.

Andrew P. Hall, Elmira, N. Y.; first prize, five dollars.

Collections of Fancy Pigeons.

H. A. Jones, Worcester, Mass.; first prize, five dollars.
Andrew P. Hall, Elmira, N. Y.; second prize, three dollars.

Collections of Toy Pigeons.

Fred. S. Blessing, Slingerlands, N. Y.; first prize, five dollars.
H. A. Jones, Worcester, Mass.; second prize, three dollars.

LOP-EARED OR MADAGASCAR RABBITS.

Bucks of any Color.

E. A. Wendell, Albany, N. Y.; first prize, three dollars.

Does of any Color.

E. A. Wendell, Albany, N. Y.; second prize, two dollars.

COMMON RABBITS.

Bucks.

G. L. Dale, Elmira, N. Y.; first prize, two dollars.
G. L. Dale, Elmira, N. Y.; second prize, one dollar.

Does.

E. A. Wendell, Albany, N. Y.; first prize, two dollars.
G. L. Dale, Elmira, N. Y.; second prize, one dollar.

FISH.

Exhibition of Brook Trout.

Oscar Larison, Caton, N. Y.; first prize, five dollars.

HATCHING APPARATUS.

Incubators.

Perfect Hatcher Company, Elmira, N. Y.; first prize, ten dollars; the Perfect Hatcher.
E. S. Renwick, New York, N. Y.; second prize, five dollars; thermostatic incubator.

Artificial Mothers.

E. S. Renwick, New York, N. Y.; first prize, ten dollars; artificial mothers or chicken brooders.

Perfect Hatcher Company, Elmira, N. Y.; second prize, five dollars; the Perfect Brooder.

IMPLEMENTS, MACHINERY, AND MANUFACTURED ARTICLES.

NOTE.—The letters S. M. denote that a silver and B. M. that a bronze medal was awarded; C. H. M. that the exhibitor is entitled to a certificate of highest merit; C. M. to a certificate of merit.

H. Carter & Sons, Canastota, N. Y.; land roller. C. M.

Clipper Chilled Plow Co., Elmira, N. Y,; plows, cultivators and horse hoes, C. H. M.

R. W. Davis, Elmira, N. Y.; roller spring-tooth harrow on wheels. C. H. M.

Genesee Valley Manufacturing Co., Mt. Morris, N. Y.; patent triple land-roller. C. H. M.

Gere, Truman, Platt & Co., Owego, N. Y.; Acme hand corn-sheller. C. H. M.

Kemp & Burpee Manufacturing Co., Syracuse, N. Y.; Kemps manure spreader. B. M.

Oliver Chilled Plow Works, Rochester, N. Y.; sulky and hand plows. C. M.

Syracuse Chilled Plow Co., Syracuse, N. Y.; plows. C. H. M.

The Seed Drill Regulator Co., Lemont, Penn.; seed drill regulator. C. H. M.

Wiard Plow Co., Batavia, N. Y.; plows. C. H. M.

Charles G. Allen & Co., Barre, Mass.; Yankee horse hay rake. C. M.

Ames Plow Co., Boston, Mass.; National family cider mill and farmers' cider mill with geared screw. C. M.

Ames Plow Co., Boston, Mass.; Doctor Bailey's ensilage cutting machines. C. H. M.

Bell City Manufacturing Co., Racine, Wis.; ensilage cutter with safety feed attachment. C. H. M.

M. T. Atchley, Geneva, N. Y.; American fruit evaporator. B. M.

Boomer & Boschert Press Co., Syracuse, N. Y.; cider-making machinery. C. H. M.

Genesee Valley Manufacturing Co., Mt. Morris, N. Y.; Little Tiger fanning mill and separator. C. H. M.

S. B. Van Duzee Manufacturing Co., Gouverneur, N. Y.; Bonanza fanning mill; storehouse mill. B. M.

Robinson and Schell, Albany, N. Y.; hay and cotton press. C. M.

J. Schoeflin & Son, Gardenville, N. Y.; feed-cutter for hand and other power. C. M.

A. W. Stevens & Son, Auburn, N. Y.; corn and feed mills. C. H. M.

Treman, Waterman & Co., Ithaca, N. Y.; Cornell's corn-sheller. C. H. M.

Treman, Waterman & Co., Ithaca, N. Y.; Cornell's Ithaca corn-sheller. C. H. M.

Vermont Farm Machine Co., Bellows Falls, Vt.; pneumatic fruit-dryer. C. H. M.

La France Fire Engine Co., Elmira, N. Y.; Hayes' extension ladder truck and fire escape. S. M.

Moravia Foundry and Machine Co., Moravia, N. Y.; saw-mills. C. H. M.

C. D. Olmstead, Elmira, N. Y.; the champion diamond mill-stone dresser. C. M.

B. W. Payn & Son, Elmira, N. Y.; agricultural and other steam engines. C. H. M.

Charles Perrigo & Co.; Groton, N. Y.; Groton portable steam engine for general agricultural purposes. C. M.

A. C. Powell, Syracuse, N. Y.; circular saw-mill. C. M.

Remington Agricultural Co., Illion, N. Y.; fire extinguishing apparatus, horse-power engine, hose carts and village trucks. B. M.

Reynolds & Lang, Ithaca, N. Y.; steam threshing engine. C. H. M.

A. P. Sedgwick, Rochester, N. Y.; Manvel's automatic wind-mill. C. H. M.

J. O. Spencer, Son & Co., Waterloo, N. Y.; agricultural steam engine. C. M.

A. W. Stevens & Son, Auburn, N. Y.; portable and traction steam engines. C. H. M.

Treman, Waterman & Co., Ithaca, N. Y.; two-horse sweep power and jack. C. H. M.

Louis Walter & Co., New York, N. Y.; Dodson's gradual reduction mill. C. M.

Walker & Chapman, Corning, N. Y.; saw table with upper and lower feed combined. C. M.

Aultman & Taylor Co., Mansfield, Ohio; traction engine, and threshing machines and horse-powers. C. M.

Wilcox & Underwood, North Lansing, N. Y.; Aldrich wind-mill, solid wheel. B. M.

John S. Carter, Syracuse, N. Y.; O. K. cabinet creamery. C. M.

John S. Carter, Syracuse, N. Y.; O. K. dairy churn. C. H. M.

Vermont Farm Machine Co., Bellows Falls, Vt.; Cooley creamer, cabinet and elevator. C. H. M.

Vermont Farm Machine Co., Bellows Falls, Vt.; Eureka butter worker. C. M.

Vermont Farm Machine Co., Bellows Falls, Vt.; butter carrier and butter printer. C. M.

Steven J. Adams, Willett, N. Y.; Adams' patent cow stanchion. C. M.

Brooks & Parsons, Addison, N. Y.; Smith's self-adjusting swing cattle stanchion. C. H. M.

Lucien Bridlebough, Taylor, N. Y.; folding manger with combined feed boxes. C. M.

Buffalo Scale Co., Buffalo, N. Y.; hay and other scales. B. M.

James Carpenter, Moravia, N. Y.; the national iron fence and corrugated fence wire. C. M.

James Carpenter, Moravia, N. Y.; hand truck. C. M.

James Carpenter, Moravia, N. Y.; grapple for hoisting barbed wire, etc. C. M.

Champion Lifting Jack Co., Palmyra, N. Y.; champion lifting jack. C. H. M.

Charles A. Colton, Olean, N. Y.; hay, grain and stock rack. C. H. M.

Cronk Hanger Co., Elmira, N. Y.; Cronk's wrought-iron slide-door hangers and barn-door stays. C. H. M.

Cronk Hanger Co., Elmira, N. Y.; Cronk's post bar. C. M.

George E. Harris, Lawrenceville, Penn.; Harris wagon jack. C. M.

Hollow Cable Manufacturing Co., Hornellsville, N. Y.; Preston's patent braided barbless wire-fence rail. C. H. M.

Howard & Jennings, Syracuse, N. Y.; pumps. C. H. M.

Jones of Binghamton, Binghamton, N. Y.; hay scales. B. M.

J. C. Lyon, Elmira, N. Y.; force pumps. C. H. M.

Osgood & Co., Binghamton, N. Y.; hay and other scales. C. H. M.

Washburn & Moen Manufacturing Co., Worcester, Mass.; iron-clad fence posts. C. H. M.

J. Schoeflin & Son, Gardenville, N. Y.; drag sawing machine. C. M.

D. T. Stow, Horseheads, N. Y.; rubber buckets and chain pumps. C. H. M.

Terry Manufacturing Co., Horseheads, N. Y.; Terry's wrought-iron barn-door hanger. C. M.

W. P. Wood & Co., Boston, Mass.; ice tools. C. H. M.

D. H. Goodell, Antrim, N. H.; Granite State power apple paring, curing and slicing machine. C. H. M.

O. P. Gould, Elmira, N. Y.; Matchless clothes wringer. C. H. M.

J. H. R. Prall, Elmira, N. Y.; Transom lifter. C. M.

Thomas Thorne, Binghamton, N. Y.; noiseless box opener. C. M.

The E. D. Clapp Wagon Co., Auburn, N. Y.; farm wagons. C. H. M.

Louis Cook Manufacturing Co., Cincinnati, Ohio; spring wagons and buggies. C. H. M.

George E. Harris, Lawrenceville, Penn.; buggy hung with Harris torsion spring. C. M.

George E. Harris, Lawrenceville, Penn.; Harris patent side and half-elliptic end springs and gearing. C. M.

N. L. Higgins, Elmira, N. Y.; grocers' delivery wagon. C. M.

The Kirkwood Wagon Co., Kirkwood, N. Y.; platform, business and pleasure wagons. C. H. M.

Lansing Wagon Works, Lansing, Mich.; farm wagons. C. H. M

Lyons Manufacturing Co., Syracuse, N. Y.; carriages, buggies and sleighs. B. M.

Pell Gear Co., Rome, N. Y; Pell's patent buggy reaches. C. H. M.

William J. Rose, Horseheads, N. Y.; carts. C. H. M.

Stockwell Wagon Co., Marathon, N. Y.; farm wagons. C. H. M.

W. F. Sweet, Seeley Creek, N. Y.; Sweet's equalizing wagon spring. C. M.

A. V. C. Vail, Elmira, N. Y.; spring gear for wagons. C. M.

Capital City Malleable Iron Co., Albany, N. Y.; safety kettle and steamer combined. C. H. M.

John Beecher, Elmira, N. Y.; Coleman's patent plow harness. C. M.

James B. Bray, Waverly, N. Y.; Bray's Acme car brake. C. M.

James B. Bray, Waverly, N. Y.; Bray's mechanical movement. C. M.

Elmira Sewer Pipe Co., Elmira, N. Y.; sewer pipes. C. H. M.

Hollow Cable Manufacturing Co., Hornellsville, N. Y.; hollow cable wire clothes line. C. H. M.

Margaret Laidlow, Elmira, N. Y.; portraits in oil. C. M.

Charles M. Lee, Elmira, N. Y.; cement pipes for sewers and solid cement cisterns. C. M.

FARM PRODUCE.

GRAIN, SEEDS AND HOPS GROWN IN 1884.

White Winter Wheat.

W. S. Eastman, Ovid, N. Y.; first prize, ten dollars; Landreth.

John H. Webber, Big Flats, N. Y.; second prize, five dollars.

Red Winter Wheat.

W. L. Eastman, Ovid, N. Y.; first prize, ten dollars; Mediterranean hybrid.

James Miller, Penn Yan, N. Y.; second prize, five dollars.

Spring Wheat.

George Campbell, Green's Landing, Penn.; first prize, ten dollars; Siberian pearl.

G. H. Breeze, Southport, N. Y.; second prize, five dollars.

Winter Rye.

George Campbell, Green's Landing, Penn.; first prize, ten dollars; Australian.

John H. Webber, Big Flats, N. Y.; second prize, five dollars.

Spring Rye.

George Campbell, Green's Landing, Penn.; first prize, ten dollars; Australian.

Fred. S. Blessing, Slingerlands, N. Y.; second prize, five dollars.

White Oats.

George Campbell, Green's Landing, Penn.; first prize, ten dollars; Welcome.

George S. McCann, Elmira, N. Y.; second prize, five dollars.

Black or Gray Oats.

George Campbell, Green's Landing, Penn.; first prize, ten dollars; Champion.

Fred. S. Blessing, Slingerlands, N. Y.; second prize; five dollars.

Two-rowed Spring Barley.

George Campbell, Green's Landing, Penn.; first prize, ten dollars; Chevalier.

Cornelius A. Bradt, Castile, N. Y.; second prize, five dollars.

Four-rowed Spring Barley.

George Campbell, Green's Landing, Penn.; first prize, ten dollars; Mensury.

George M. Ward, Elmira, N. Y.; second prize, five dollars.

Yellow Indian Corn (shelled).

J. C. Van Allen, Slingerlands, N. Y.; first prize, ten dollars.

E. Van Allen, Bethlehem Centre, N. Y.; second prize, five dollars.

White Indian Corn (shelled).

E. Van Allen, Bethlehem Centre, N. Y.; second prize, five dollars.

Large Field Beans.

Cornelius A. Bradt, Castile, N. Y.; first prize, ten dollars.

Charles Fink, Jr., Lyons, N. Y.; second prize, five dollars; Red Kidney.

Small Field Beans.

H. J. Kent, Palmyra, N. Y.; first prize, ten dollars.

Large Field Peas.

Isaac F. Tillinghast, La Plume, Penn.; first prize, ten dollars.
George Chamberlain, Southport, N. Y.; second prize, five dollars.

Small Field Peas.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, ten dollars.
Isaac F. Tillinghast, La Plume, Penn.; second prize, five dollars.

Buckwheat.

George Campbell, Green's Landing, Penn.; first prize, five dollars; Silver Hull.
Robert Templeton, Ulster, Penn.; second prize, three dollars; Silver Hull.

Medium Clover Seed.

Jesse Lyon, Catharine, N. Y.; first prize, five dollars.
Edd Crofut, Millport, N. Y.; second prize, three dollars.

Large Clover Seed.

Isaac F. Tillinghast, La Plume, Penn.; first prize, five dollars.

Timothy Seed.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, five dollars.
Edd Crofut, Millport, N. Y.; second prize, three dollars.

Millet.

John H. Webber, Big Flats, N. Y.; first prize, five dollars.
E. Van Allen, Bethlehem Centre, N. Y.; second prize, three dollars.

Flax Seed.

George Campbell, Green's Landing, Penn.; first prize, five dollars; Russian.
George Chamberlain, Southport, N. Y.; second prize, three dollars.

Sorghum Seed.

George Chamberlain, Southport, N. Y.; first prize, five dollars.
E. Van Allen, Bethlehem Centre, N. Y.; second prize, three dollars.

Seed Ears of Yellow Corn (eight-rowed).

L. B. Babcock, Fulton, N. Y.; first prize, five dollars.
Charles Coolidge, Phelps, N. Y.; second prize, three dollars; Early Longfellow.

Seed Ears of Yellow Corn (twelve-rowed).

Isaac F. Tillinghast, La Plume, Penn.; first prize, five dollars.

Myron F. Pierson, Seneca Castle, N. Y.; second prize, three dollars; King James.

Seed Ears of White Corn.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, five dollars.

Isaac F. Tillinghast, La Plume, Penn.; second prize, three dollars.

Seed Ears, Dent Corn.

Charles Coolidge, Phelps, N. Y.; first prize, five dollars; "Pride of the North."

George Chamberlain, Southport, N. Y.; second prize, three dollars.

Seed Ears, Early Sweet Corn.

Charles Coolidge, Phelps, N. Y.; first prize, five dollars; Crosby's Early.

Howard Brothers, Irondequoit, N. Y.; second prize, three dollars.

Seed Ears, Late Sweet Corn.

Howard Brothers, Irondequoit, N. Y.; first prize, five dollars.

John H. Webber, Big Flats, N. Y.; second prize, three dollars.

Hops.

Harry W. Hoffman, Elmira, N. Y.; first prize, ten dollars.

VEGETABLES.

Celery.

Howard Brothers, Irondequoit, N. Y.; first prize, three dollars.

A. Donald, Horseheads, N. Y.; second prize, two dollars.

Cauliflowers.

George Chamberlain, Southport, N. Y.; first prize, three dollars.

Howard Brothers, Irondequoit, N. Y.; second prize, two dollars.

Broccoli.

George Chamberlain, Southport, N. Y.; first prize, three dollars.

Carl Mussig, Havana, N. Y.; second prize, two dollars.

Cabbages.

L. B. Babcock, Fulton, N. Y.; first prize, three dollars.

Howard Brothers, Irondequoit, N. Y.; second prize, two dollars.

Lettuce.

Howard Brothers, Irondequoit, N. Y.; first prize, three dollars.

George S. McCann, Elmira, N. Y.; second prize, two dollars.

Turnips.

L. B. Babcock, Fulton, N. Y.; first prize, three dollars.
Carl Mussig, Havana, N. Y.; second prize, two dollars.

Mangolds.

J. E. Collins, Elmira, N. Y.; first prize, three dollars.
Alvin Devereux, Deposit, N. Y.; second prize, two dollars.

Beets.

L. B. Babcock, Fulton, N. Y.; first prize, three dollars.
E. Van Allen, Bethlehem Centre, N. Y.; second prize, two dollars.

Orange Carrots.

Howard Brothers, Irondequoit, N. Y.; first prize, three dollars.
E. Van Allen, Bethlehem Centre, N. Y.; second prize, two dollars.

White Carrots.

Carl Mussig, Havana, N. Y.; first prize, three dollars.
Isaac F. Tillinghast, La Plume, Penn.; second prize, two dollars.

Parsnips.

George S. McCann, Elmira, N. Y.; first prize, three dollars.
Howard Brothers, Irondequoit, N. Y.; second prize, two dollars.

Salsify.

George Chamberlain, Southport, N. Y,; first prize, three dollars.
Carl Mussig, Havana, N. Y.; second prize, two dollars.

Kohl-Rabi.

L. B. Babcock, Fulton, N. Y.; first prize, three dollars.
George Chamberlain, Southport, N. Y.; second prize, two dollars.

Onions.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, three dollars.
L. B. Babcock, Fulton, N. Y.; second prize, two dollars.

Tomatoes.

Howard Brothers, Irondequoit, N. Y.; first prize, three dollars.
Myron F. Pierson, Seneca Castle, N. Y.; second prize, two dollars.

Egg Plants.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, three dollars.
Howard Brothers, Irondequoit, N. Y.; second prize, two dollars.

Garden Beans.

W. E. Hayward, Rochester, N. Y.; first prize, three dollars.
Myron F. Pierson, Seneca Castle, N. Y.; second prize, two dollars.

Peppers.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, three dollars.
A. Donald, Horseheads, N. Y.; second prize, two dollars.

Squashes.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, three dollars.
Howard Brothers, Irondequoit, N. Y.; second prize, two dollars.

Pumpkins.

Isaac F. Tillinghast, La Plume, Penn.; first prize, three dollars.
E. Van Allen, Bethlehem Centre, N. Y.; second prize, two dollars.

Sweet Potatoes.

George Chamberlain, Southport, N. Y.; first prize, three dollars.
Howard Brothers, Irondequoit, N. Y.; second prize, two dollars.

Potatoes — Exhibitions of Early Varieties.

Myron F. Pierson, Seneca Castle, N. Y.; first prize, ten dollars.
Isaac F. Tillinghast, La Plume, Penn.; second prize, five dollars.

Potatoes — Exhibitions of Late Varieties.

Myron F. Pierson, Seneca Castle, N. Y.; first prize, ten dollars.
L. B. Babcock, Fulton, N. Y.; second prize, five dollars.

Potatoes — Exhibitions of Stock Feeding Varieties.

Myron F. Pierson, Seneca Castle, N. Y.; first prize, ten dollars.
Isaac F. Tillinghast, La Plume, Penn.; second prize, five dollars.

Collections of Vegetables.

Howard Brothers, Irondequoit, N. Y.; twelve dollars and fifty cents.
E. Van Allen, Bethlehem Centre, N. Y.; twelve dollars and fifty cents.

BUTTER.

Special Prize for the Six Best Packages, not less than 30 lbs. net each, made in the same Creamery or Private Dairy.

A. C. Biggar, Hamden, N. Y.; fifty dollars.

Packages made in June in Creamery.

John P. Straight, Laona, N. Y.; first prize, thirty dollars.
DeWitt C. Curtis, Horseheads, N. Y.; second prize, twenty dollars.
George W. Kinney, Stanwix, N. Y.; third prize, ten dollars.

Packages made at any time in Creamery.

Robert P. Mosher, Horseheads, N. Y.; first prize, thirty dollars.
George W. Kinney, Stanwix, N. Y.; second prize, twenty dollars.
Hoffman Creamery Co., Horseheads, N. Y.; third prize, ten dollars.

Packages made in June, in Private Dairy.

D. A. Atwater, West Elmira, N. Y.; first prize, thirty dollars.
Alvin Devereux, Deposit, N. Y.; second prize, twenty dollars.
C. Vanderhoff, West Elmira, N. Y.; third prize, ten dollars.

Packages made at any time in Private Dairy.

William F. Ford, West Davenport, N. Y.; first prize, thirty dollars.
A. C. Biggar, Hamden, N. Y.; second prize, twenty dollars.
W. T. Wilson, Geddes, N. Y.; third prize, ten dollars.

Molds or Rolls.

Alvin Devereux, Deposit, N. Y.; first prize, fifteen dollars.
C. Vanderhoff, West Elmira, N. Y.; second prize, ten dollars.
C. P. Whitney, Orleans, N. Y.; third prize, five dollars.

CHEESE.

Special Prize for the Best Dozen Cheeses, not less than 20 lbs. each, from the same Factory or Dairy, and suitable for Army and other Uses.

Laona Factory, Laona, N. Y.; fifty dollars.

American Cheese over One Year Old.

G. A. Bonfoy, Peterborough, N. Y.; first prize, thirty dollars.
Mrs. J. A. Henry, Reed's Corners, N. Y.; second prize, twenty dollars.
Andrew Cowden, Laona, N. Y.; third prize, ten dollars.

American Cheese less than One Year Old.

Laona Factory, Laona, N. Y.; first prize, thirty dollars.
Andrew Cowden, Laona, N. Y.; second prize, twenty dollars.
J. R. Holden, Franklinville, N. Y.; third prize, ten dollars.

BREAD, SUGAR, ETC.

Wheaten Bread.

Mrs. J. A. Henry, Reed's Corners, N. Y.; first prize, five dollars.
E. Van Allen, Bethlehem Centre, N. Y.; second prize, three dollars.

Rye Bread.

Mrs. J. A. Henry, Reed's Corners, N. Y.; first prize, five dollars.
E. Van Allen, Bethlehem Centre, N. Y.; second prize, three dollars.

Indian, or Rye and Indian, Bread.

Mrs. J. A. Henry, Reed's Corners, N. Y.; first prize, five dollars.
E. Van Allen, Bethlehem Centre, N. Y.; second prize, three dollars.

Maple Sugar.

William F. Ford, West Davenport, N. Y.; first prize, five dollars.

Maple Syrup.

Mrs. W. H. Graves, Blossvale, N. Y.; first prize, five dollars.
William F. Ford, West Davenport, N. Y.; second prize, three dollars.

Preserved Fruits.

Cornelius A. Bradt, Castile, N. Y.; first prize, five dollars.
E. Van Allen, Bethlehem Centre, N. Y.; second prize, three dollars.

Pickles in Vinegar.

Mrs. Jackson Goldsmith, Elmira, N. Y.; first prize, five dollars.
Mrs. H. C. Howland, Elmira, N. Y.; second prize, three dollars.

Dried Apples.

Mrs. J. A. Henry, Reed's Corners, N. Y.; first prize, five dollars.
E. Van Allen, Bethlehem Centre, N. Y.; second prize, three dollars.

Dried Peaches.

Miss L. P. Tennant, Stanwix, N. Y.; first prize, five dollars.

Dried Whortleberries.

Miss L. P. Tennant, Stanwix, N. Y.; first prize, five dollars.

Dried Raspberries.

Mrs. J. T. Griffith, Millport, N. Y.; first prize, five dollars.
G. C. Wickham, Havana, N. Y.; second prize, three dollars.

Box Honey.

Peter Miller, Fredonia, N. Y.; first prize, five dollars.
C. W. Canfield, Athens, Penn.; second prize, three dollars.

Extracted or Strained Honey.

Peter Miller, Fredonia, N. Y.; first prize, five dollars.
M. H. Tennant, Rome, N. Y.; second prize, three dollars.

DOMESTIC MANUFACTURES.

Woolen Blankets.

M. H. Tennant, Rome, N. Y.; first prize, five dollars.

All-Wool Horse Blankets.

Miss L. P. Tennant, Stanwix, N. Y.; first prize, five dollars.
Mrs. S. M. Williams, Taberg, N. Y.; second prize, three dollars.

Woolen Flannel.

M. H. Tennant, Rome, N. Y.; first prize, five dollars.
Mrs. S. M. Williams, Taberg, N. Y.; second prize, three dollars.

Woolen and Cotton Flannel.

Mrs. R. M. Lewis, Brocton, N. Y.; first prize, five dollars.

Linsey Woolsey.

Miss L. P. Tennant, Stanwix, N. Y.; first prize, five dollars.

Woolen Carpet.

M. E. Berk, Fassett, Penn.; second prize, three dollars.

Rag Carpet.

Mrs. G. H. Humphrey, Breesport, N. Y.; first prize, five dollars.
J. A. Wheeler, Horseheads, N. Y.; second prize, three dollars.

Hearth Rugs.

Mrs. Sarah E. Linderman, Elmira, N. Y.; first prize, five dollars.
Miss Jennie Parsons, Elmira, N. Y.; second prize, three dollars.

Double Carpet Coverlets.

Mrs. S. M. Williams, Taberg, N. Y.; second prize, three dollars.

Linen Diaper.

Mrs. R. M. Lewis, Brockton, N. Y.; first prize, five dollars.
Miss Polly A. Nelson, Brockton, N. Y.; second prize, three dollars.

Linen Kersey.

Mrs. R. M. Lewis, Brockton, N. Y.; first prize, five dollars.

Tow Cloth.

Miss Polly A. Nelson, Brockton, N. Y.; first prize, five dollars.

Linen Bagging.

M. H. Tennant, Rome, N. Y.; second prize, three dollars.

Knit Bed Spreads.

Mrs. M. J. Hathorn, Elmira, N. Y.; first prize, three dollars.
Mrs. George P. McLearn, Humphrey Centre, N. Y.; second prize, two dollars.

Worked or Quilted Bed Spreads.

Mrs. M. J. Hathorn, Elmira, N. Y.; first prize, three dollars.
Mrs. F. E. Struppler, Elmira, N. Y.; second prize, two dollars.

Silk Quilts.

Mrs. E. B. Smith, Elmira, N. Y.; first prize, three dollars.
Miss B. Valairs, Elmira, N. Y.; second prize, two dollars.

Balmoral Petticoats.

Mrs. S. M. Williams, Taberg, N. Y.; first prize, three dollars.
Mrs. W. H. Graves, Blossvale, N. Y.; second prize, two dollars.

Woolen Knit Stockings.

Mrs. W. H. Graves, Blossvale, N. Y.; first prize, three dollars.
Miss L. P. Tennant, Stanwix, N. Y.; second prize, two dollars.

Worsted Knit Stockings.

M. H. Tennant, Rome, N. Y.; first prize, three dollars.
Miss L. P. Tennant, Stanwix, N. Y.; second prize, two dollars.

Woolen Knit Mittens.

Mrs. Jackson Goldsmith, Elmira, N. Y.; first prize, three dollars.
Mrs. W. H. Graves, Blossvale, N. Y.; second prize, two dollars.

Woolen Fringe Mittens.

Mrs. S. M. Williams, Taberg, N. Y.; first prize, three dollars.
M. H. Tennant, Rome, N. Y.; second prize, two dollars.

Linen or Cotton Knit Stockings.

C. L. Turner, Horseheads, N. Y.; first prize, three dollars.
M. H. Tennant, Rome, N. Y.; second prize, two dollars.

Linen Sewing Thread.

Mrs. R. M. Lewis, Brockton, N, Y.; first prize, three dollars.
Mrs. S. M. Williams, Taberg, N. Y.; second prize, two dollars.

FLOWERS.

PROFESSIONAL LIST.

Exhibitions of Cut Flowers.

Mrs. H. D. Wells, Elmira, N. Y.; first prize, ten dollars.
Mrs. C. Compton, Elmira, N. Y.; second prize, five dollars.

Collections of Dahlias.

James Vick, Rochester, N. Y.; first prize, six dollars.

Twenty-four Dahlias.

James Vick, Rochester, N. Y.; first prize, five dollars.
Carl Mussig, Havana, N. Y.; second prize, three dollars.

Twelve Dahlias.

James Vick, Rochester, N. Y.; first prize, three dollars.
Mrs. H. D. Wells, Elmira, N. Y.; second prize, two dollars.

American Seedling Dahlias.

James Vick, Rochester, N. Y.; first prize, one dollar.

Collections of Roses.

Mrs. H. D. Wells, Elmira, N. Y.; first prize, six dollars.
Grove P. Rawson, Elmira, N. Y.; second prize, three dollars.

Collections of Phloxes.

James Vick, Rochester, N. Y.; first prize, five dollars.
Mrs. H. D. Wells, Elmira, N. Y.; second prize, three dollars.

Seedling Phloxes.

Grove P. Rawson, Elmira, N. Y.; first prize, one dollar.

Collections of Verbenas.

James Vick, Rochester, N. Y.; first prize, five dollars.
Mrs. H. D. Wells, Elmira, N. Y.; second prize, three dollars.

Twelve Verbenas.

Mrs. H. D. Wells, Elmira, N. Y.; first prize, three dollars.
James Vick, Rochester, N. Y.; second prize, two dollars.

American Seedling Verbenas.

James Vick, Rochester, N. Y.; first prize, one dollar.

Collections of Asters.

James Vick, Rochester, N. Y.; first prize, three dollars.
Mrs. H. D. Wells, Elmira, N. Y.; second prize, two dollars.

Collections of Celosias.

Mrs. H. D. Wells, Elmira, N. Y.; first prize, three dollars.
James Vick, Rochester, N. Y.; second prize, two dollars.

Collections of Lilies.

James Vick, Rochester, N. Y.; first prize, three dollars.
Mrs. H. D. Wells, Elmira, N. Y.; second prize, two dollars.

Collections of Pansies.

Grove P. Rawson, Elmira, N. Y.; first prize, three dollars.
Mrs. H. D. Wells, Elmira, N. Y.; second prize, two dollars.

Collections of Ten Week Stocks.

Carl Mussig, Havana, N. Y.; first prize, three dollars.
James Vick, Rochester, N. Y.; second prize, two dollars.

Collections of Gladiolus.

James Vick, Rochester, N. Y.; first prize, three dollars.
Mrs. H. D. Wells, Elmira, N. Y.; second prize, two dollars.

Twelve Varieties of Gladiolus.

James Vick, Rochester, N. Y.; first prize, two dollars.

AMATEUR LIST.

Collections of Cut Flowers.

S. S. Mathews, West Elmira, N. Y.; first prize, ten dollars.
Mrs. Asa Elliot, West Elmira, N. Y.; second prize, five dollars.

Collections of Dahlias.

Mrs. J. T. Griffiths, Millport, N. Y.; first prize, six dollars.
Miss L. P. Tennant, Stanwix, N. Y.; second prize, three dollars.

Twelve Dahlias.

M. H. Tennant, Rome, N. Y.; first prize, three dollars.
Mrs. J. T. Griffiths, Millport, N. Y.; second prize, two dollars.

Six Dahlias.

M. H. Tennant, Rome, N. Y.; first prize, two dollars.
Andrew Hogg, Arnot, Penn.; second prize, one dollar.

Collections of Roses.

Mrs. J. T. Griffiths, Millport, N. Y.; first prize, six dollars.

Collections of Verbenas.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, five dollars.
Mrs. Asa Elliot, West Elmira, N. Y.; second prize, three dollars.

Twelve Verbenas.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, three dollars.

Six Verbenas.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, two dollars.
Miss L. P. Tennant, Stanwix, N. Y.; second prize, one dollar.

Collections of Phloxes.

Mrs. J. T. Griffiths, Millport, N. Y.; first prize, five dollars.
M. H. Tennant, Rome, N. Y.; second prize, three dollars.

Perennial Phloxes (six varieties named).

Miss L. P. Tennant, Stanwix, N. Y.; first prize, two dollars.
E. Van Allen, Bethlehem Centre, N. Y.; second prize, one dollar.

Collections of Asters.

S. S. Mathews, West Elmira, N. Y.; first prize, three dollars.
Mrs. J. T. Griffiths, Millport, N. Y.; second prize, two dollars.

Collections of Pansies.

Mrs. Jervis Langdon, Elmira, N. Y.; first prize, three dollars.
Mrs. J. T. Griffiths, Millport, N. Y.; second prize, two dollars.

Collections of Ten Week Stocks.

Mr J. T. Griffiths, Millport, N. Y.; first prize, three dollars.
Miss L. P. Tennant, Stanwix, N. Y.; second prize, two dollars.

Collections of Gladiolus.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, three dollars.
Miss L. P. Tennant, Stanwix, N. Y.; second prize, two dollars.

Twelve Varieties of Gladiolus.

M. H. Tennant, Rome, N. Y.; first prize, two dollars.
E. Van Allen, Bethlehem Centre, N. Y.; second prize, one dollar.

Everlasting Flowers.

Mrs. J. T. Griffiths, Millport, N. Y.; first prize, three dollars.
Mrs. Asa Elliot, West Elmira, N. Y.; second prize, two dollars.

GENERAL LIST — OPEN TO ALL COMPETITORS.

Collections of Pot-Plants.

Mrs. Jervis Langdon, Elmira, N. Y.; first prize, fifteen dollars.
Mrs. C. Compton, Elmira, N. Y.; second prize, ten dollars.

Twenty Greenhouse and Stove Plants.

Mrs. Jervis Langdon, Elmira, N. Y.; first prize, ten dollars.
Mrs. H. D. Wells, Elmira, N. Y.; second prize, five dollars.

Ten Greenhouse and Stove Plants.

Mrs. Jervis Langdon, Elmira, N. Y.; first prize, five dollars.
Mrs. H. D. Wells, Elmira, N. Y.; second prize, three dollars.

Groups of Palms.

Mrs. Jervis Langdon, Elmira, N. Y.; first prize, eight dollars.
Mrs. H. D. Wells, Elmira, N. Y.; second prize, four dollars.

Groups of Ferns.

Mrs. Jervis Langdon, Elmira, N. Y.; first prize, five dollars.
Mrs. H. D. Wells, Elmira, N. Y.; second prize, three dollars.

Six Variegated Leaved Plants.

Mrs. Jervis Langdon, Elmira, N. Y.; first prize, five dollars.
Mrs. H. D. Wells, Elmira, N. Y.; second prize, three dollars.

Single Variegated Leaved Plants.

Mrs. Jervis Langdon, Elmira, N. Y.; first prize, two dollars.

Six Fuchsias.

Mrs. H. D. Wells, Elmira, N. Y.; first prize, three dollars.
Grove P. Rawson, Elmira, N. Y.; second prize, two dollars.

One Fuchsia.

Mrs. Jervis Langdon, Elmira, N. Y.; first prize, two dollars.

Twelve Zonal Pelargoniums (Single).

Mrs. H. D. Wells, Elmira, N. Y.; first prize, five dollars.
Grove P. Rawson, Elmira, N. Y.; second prize, three dollars.

One Zonal Pelargonium (Single).

Mrs. H. D. Wells, Elmira, N. Y.; first prize, two dollars.

Six Zonal Pelargoniums (Double).

Mrs. H. D. Wells, Elmira, N. Y.; first prize, three dollars.
Grove P. Rawson, Elmira, N. Y.; second prize, two dollars.

One Zonal Pelargonium (Double).

Grove P. Rawson, Elmira, N. Y.; first prize, two dollars.

Twelve Succulents other than Cacti.

Mrs. H. D. Wells, Elmira, N. Y.; first prize, five dollars.

Pairs of Hand Bouquets.

Grove P. Rawson, Elmira, N. Y.; first prize, five dollars.
Mrs. H. D. Wells, Elmira, N. Y.; second prize, three dollars.

Pairs of Table Bouquets.

Grove P. Rawson, Elmira, N. Y.; first prize, five dollars.
Mrs. H. D. Wells, Elmira, N. Y.; second prize, three dollars.

Button-hole Bouquets.

Grove P. Rawson, Elmira, N. Y.; first prize, three dollars.
Mrs. H. D. Wells, Elmira, N. Y.; second prize, two dollars.

Baskets of Flowers.

Mrs. H. D. Wells, Elmira, N. Y.; first prize, three dollars.
Grove P. Rawson, Elmira, N. Y.; second prize, two dollars.

Pairs of Hanging Baskets.

Grove P. Rawson, Elmira, N. Y.; first prize, three dollars.

Dinner Table Designs.

Grove P. Rawson, Elmira, N. Y.; first prize, five dollars.
Mrs. H. D. Wells, Elmira, N. Y.; second prize, three dollars.

Rustic Stands.

Grove P. Rawson, Elmira, N. Y.; first prize, five dollars.

Display of Newly Introduced Flowers.

Mrs. Jervis Langdon, Elmira, N. Y.; first prize, five dollars.
Mrs. H. D. Wells, Elmira, N. Y.; second prize, three dollars.

FRUITS.

PROFESSIONAL LIST.

Collections of Apples.

Ellwanger & Barry, Rochester, N, Y.; first prize, ten dollars.

Collections of Pears.

Ellwanger & Barry, Rochester, N. Y.; first prize, fifteen dollars.

Twenty Varieties of Pears.

Ellwanger & Barry, Rochester, N. Y.; first prize, ten dollars.

Ten Varieties of Pears.

Ellwanger & Barry, Rochester, N. Y.; first prize, five dollars.

Collections of Plums.

Ellwanger & Barry, Rochester, N. Y.; first prize, five dollars.
O. H. Budd, Hector, N. Y.; second prize, three dollars.

Five Varieties of Plums.

O. H. Budd, Hector, N. Y.; first prize, three dollars.
Ellwanger & Barry, Rochester, N. Y.; second prize, two dollars.

Dish of One Variety of Plums.

Ellwanger & Barry, Rochester, N. Y.; first prize, two dollars.
O. H. Budd, Hector, N. Y.; second prize, one dollar.

Ten Varieties of Native Grapes.

Ellwanger & Barry, Rochester, N. Y.; first prize, ten dollars.
W. Ely, Hector, N. Y.; second prize, five dollars.

Five Varieties of Native Grapes.

O. H. Budd, Hector, N. Y.; first prize, five dollars.
W. Ely, Hector, N. Y.; second prize, three dollars.

Ten Varieties of Foreign Grapes.

Ellwanger & Barry, Rochester, N. Y.; first prize, ten dollars.

AMATEUR LIST.

Collections of Apples.

M. F. Pierson, Seneca Castle, N. Y.; first prize, ten dollars.
E. Van Allen, Bethlehem Centre, N. Y.; second prize, five dollars.

Ten Varieties of Apples.

M. F. Pierson, Seneca Castle, N. Y.; first prize, five dollars.
P. C. Van Allen, Slingerlands, N. Y.; second prize, three dollars.

Five Varieties of Apples.

M. F. Pierson, Seneca Castle, N. Y.; first prize, three dollars.

Ten Varieties of Pears.

G. E. Adriance, Hector, N. Y.; second prize, three dollars.

Five Varieties of Plums.

G. E. Adriance, Hector, N. Y.; first prize, three dollars.

Three Varieties of Plums.

G. E. Adriance, Hector, N. Y.; first prize, two dollars.

Ten Varieties of Native Grapes.

G. E. Adriance, Hector, N. Y.; first prize, six dollars.

Five Varieties of Native Grapes.

G. E. Adriance, Hector, N. Y.; first prize, three dollars.

Five Varieties Foreign Grapes.

Mrs. Jervis Langdon, Elmira, N. Y.; first prize, six dollars.

One Variety Foreign Grapes.

Mrs. Jervis Langdon, Elmira, N. Y.; first prize, three dollars.

FRUITS (SINGLE DISHES), OPEN TO ALL.

APPLES.

Fall Pippin.

P. C. Van Allen, Slingerlands, N. Y.; two dollars.

Gravenstein.

M. F. Pierson, Seneca Castle, N. Y.; two dollars.

Baldwin.

M. F. Pierson, Seneca Castle, N. Y.; two dollars.

King of Tompkins County.

M. F. Pierson, Seneca Castle, N. Y.; two dollars.

Northern Spy.

M. F. Pierson, Seneca Castle, N. Y.; two dollars.

Rhode Island Greening.

M. F. Pierson, Seneca Castle, N. Y.; two dollars.

Twenty-Ounce.

M. F. Pierson, Seneca Castle, N. Y.; two dollars.

Red Canada.

M. F. Pierson, Seneca Castle, N. Y.; two dollars.

PEARS.

Bartlett.

W. Ely, Hector, N. Y.; two dollars.

Beurre d'Anjou.

Ellwanger & Barry, Rochester, N. Y.; two dollars,

Beurre Clairgeau.

Ellwanger & Barry, Rochester, N. Y.; two dollars.

Beurre Bosc.

G. E. Adriance, Hector, N. Y.; two dollars.

Duchesse d'Angoulême.

Ellwanger & Barry, Rochester, N. Y.; two dollars.

Doyenne Boussock.

Ellwanger & Barry, Rochester, N. Y.; two dollars.

Flemish Beauty.

Ellwanger & Barry, Rochester, N. Y.; two dollars.

Seckel.

S. C. Beardsley, Watkins, N. Y.; two dollars.
P. C. Van Allen, Slingerlands, N. Y.; two dollars.

Lawrence.

Ellwanger & Barry, Rochester, N. Y.; two dollars.

Winter Nelis.

Ellwanger & Barry, Rochester, N. Y.; two dollars.

GRAPES.

Concord.

W. Ely, Hector, N. Y.; two dollars.

Catawba.

W. Ely, Hector, N. Y.; two dollars.

Delaware.

W. Ely, Hector, N. Y.; two dollars.

Hartford.

W. Ely, Hector, N. Y.; two dollars.

Any of Rogers' Varieties.

W. Ely, Hector, N. Y.; two dollars.

AWARDS

AT THE

FORTY-FIFTH ANNUAL CATTLE SHOW AND FAIR OF THE NEW YORK STATE AGRICULTURAL SOCIETY, HELD AT ALBANY, SEPTEMBER 10–16, 1885.

CATTLE.

SHORTHORNS.

Shorthorn Herd.

B. C. Rumsey, Buffalo, N. Y.; large gold medal.

Bull, Knight of Oxford 2d, roan, bred by R. P. Davies, Horton, England; calved March 3, 1879, sire Duke of Hillhurst (28401), dam Marchioness of Oxford by 4th Duke of Geneva (30958), gr. d. 8th Maid of Oxford by 2d Duke of Geneva (23752).

Cow, Wisdom 2d, roan, bred by Lord Fitzhardinge, Berkeley Castle, England; calved June 2, 1879, sire Duke of Connaught (33604), dam Wisdom by 3d Duke of Gloster (33655), gr. d. Winsomedale by Baron Oxford 4th (25581).

Cow, Thorndale Rose 19th, red with a little white, bred by Lord Braybrooke, Audley End, England; calved July 24, 1880, sire Duke of Connaught (33604), dam Thorndale Rose 5th by Grand Duke 17th (24064), gr. d. Thorndale Rose 2d by Grand Duke 4th (19874).

Cow, Lady Turncroft Wild Eyes 3d, red, bred by the Rev. P. Graham, Turncroft, England; calved November 14, 1880, sire 7th Duke of Tregunter (38194), dam Lady Ashton Wild Eyes 2d by Grand Duke of Thorndale 2d (31298), gr. d. Winsome 10th by 18th Duke of Oxford (25995).

Heifer, Kirklevington of Erie 4th, red, bred by exhibitor; calved March 1, 1883, sire Knight of Oxford 2d, 39549, dam Rowfant Kirklevington 4th by 2d Duke of Underly (36551), gr. d. Siddington 12th by 2d Duke of Tregunter (26022).

Heifer, Barrington of Erie 5th, red, bred by exhibitor; calved August 5, 1883, sire Knight of Oxford 2d, 39549, dam 5th Marchioness of Barrington by 2d Duke of Hillhurst, 12893, gr. d. Grand Duchess of Barrington by 18th Duke of Oxford (25995).

Shorthorn Bulls and Produce.

B. C. Rumsey, Buffalo, N. Y.; large gold medal; Knight of Oxford 2d.

Shorthorn Bulls, over Three Years Old.

B. C. Rumsey, Buffalo, N. Y.; first prize, fifty dollars; Knight of Oxford 2d, roan, bred by R. P. Davies, Horton, England; calved March 3, 1879, sire Duke of Hillhurst (28401), dam Marchioness of Oxford by 4th Duke of Geneva (30958), gr. d. 8th Maid of Oxford by 2d Duke of Geneva (23752).

A. F. Stearns & Son, Marion, N. Y.; second prize, twenty-five dollars; Duke of Aylmer 4th, roan, bred by Canada West Farm Stock Association, Brantford, Canada; calved February 11, 1882, sire 4th Duke of Clarence, 26188, dam Duchess of Alymer 3d by 4th Duke of Barrington, 16708, gr. d. Duchess of Dereham 6th by Lord Barrington, 17550.

Shorthorn Bulls, One Year Old.

B. C. Rumsey, Buffalo, N. Y.; first prize, thirty dollars; Lord Barrington of Erie 4th, red, bred by exhibitor; calved May 24, 1884; sire Knight of Oxford, 2d, 39549, dam 6th Marchioness of Barrington by Duke of Oxford 35th, 26350, gr. d. Duchess of Barrington by 18th Duke of Oxford (25995).

Thomas Boak & Son, Gerry, N. Y.; second prize, fifteen dollars; Robin Hood, roan, bred by exhibitors; calved December 18, 1883, sire Hopeful, 63038, dam Lady Rothesay by Duke of Rothesay, 62528, gr. d. Duchess of Cumberland by Duke of Cumberland, 58590.

Shorthorn Bull Calves.

Thomas Boak & Son, Gerry, N. Y.; first prize, ten dollars; Chautauqua Duke, red, bred by exhibitors; calved February 1, 1885; sire Hopeful, 63038, dam Roseberry by Duke of Cumberland, 58590, gr. d. Strawberry by Rock, 64259.

Shorthorn Cows, over Three Years Old.

B. C. Rumsey, Buffalo, N. Y.; first prize, forty dollars; Thorndale Rose 19th, red with a little white, bred by Lord Braybrooke, Audley End, England; calved July 24, 1880, sire Duke of Connaught (33604), dam Thorndale Rose 5th by Grand Duke 17th (24064), gr. d. Thorndale Rose 2d by Grand Duke 4th (19874).

A. F. Stearns & Son, Marion, N. Y.; second prize, twenty dollars; Bride of Clifton, red with a little white, bred by Benjamin Fellows, Clifton, N. Y.; calved October 18, 1879, sire Earl of Oxford, 35422, dam Bride of Brant by Lord Barrington, 17550, gr. d. Bride of Greenwood by Whittington, 3559.

Shorthorn Heifers, Two Years Old.

B. C. Rumsey, Buffalo, N. Y.; first prize, thirty dollars; 7th Countess of Belvoir, white, bred by exhibitor; calved March 6th, 1883, sire Knight of Oxford 2d, 39549, dam 4th Countess of Belvoir by 22d Duke of Airdrie, 16695, gr. d. Campaspe 2d by 4th Grand Duke of Oxford, 5734.

B. C. Rumsey, Buffalo, N. Y.; second prize, fifteen dollars; Barrington of Erie 5th, red, bred by exhibitor; calved August 5, 1883, sire Knight of Oxford 2d, 39549, dam 5th Marchioness of Barrington by 2d Duke of Hillhurst, 12893, gr. d. Grand Duchess of Barrington by 18th Duke of Oxford (25995).

Shorthorn Heifers, One Year Old.

Thomas Boak & Son, Gerry, N. Y.; first prize, twenty dollars; Farewell 4th, roan, bred by exhibitors; calved December 2, 1883, sire Hopeful, 63038, dam Farewell 2d by Duke of Cumberland, 58590, gr. d. Farewell by Royal Westmoreland (35416).

Thomas Boak & Son, Gerry, N. Y.; second prize, ten dollars; Countess 3d, red, bred by exhibitors; calved December 7, 1883, sire Hopeful, 63038, dam Countess by Duke of Cumberland, 58590, gr. d. Farewell by Royal Westmoreland (35416).

Shorthorn Heifer Calves.

Thomas Boak & Son, Gerry, N. Y.; first prize, ten dollars; Countess 5th, roan, bred by exhibitors; calved January 15, 1885, sire Hopeful 63038, dam Countess by Duke of Cumberland, 58590, gr. d. Farewell by Royal Westmoreland (35416).

Thomas Boak & Son, Gerry, N. Y.; second prize, five dollars; Mabel, roan, bred by exhibitors; calved February 20, 1885; sire Hopeful, 63038, dam Maggie 2d by High Sheriff 3d, 60023, gr. d. Margaret by Duke of Cumberland, 58590.

DEVONS.

Devon Herd.

Joseph Hilton, New Scotland, N. Y.; large gold medal.

Bull, Prince of Wales 20th, bred by exhibitor; calved December 12, 1878, sire Crown Prince, 434, dam Edith 9th by Prince of Wales, 151, gr. d. Fanny by Prince of Wales, 151.

Cow, Edith 12th, bred by exhibitor; calved December 12, 1875, sire Prince of Wales, 151, dam Edith 4th by Prince of Wales, 151, gr. d. Edith 2d by Sachem, 1089.

Cow, Edith 16th, bred by exhibitor; calved February 9, 1879; sire Crown Prince, 434, dam Edith 12th by Prince of Wales, 151, gr. d. Edith 4th by Prince of Wales, 151.

Cow, Lucy Crown, bred by exhibitor; calved March 3, 1881, sire Crown Prince, 434, dam Edith 13th by Prince of Wales, 151, gr. d. Edith 7th by Prince of Wales, 151.

Heifer, Maid of Utica, bred by exhibitor; calved September 25, 1882, sire Prince John H., 2458, dam Edith 12th by Prince of Wales, 151, gr. d. Edith 4th by Prince of Wales, 151.

Heifer, Henrietta H., bred by exhibitor; calved December 14, 1883, sire Prince of Wales 20th, 1395, dam Lucy Crown by Crown Prince, 434, gr. d. Edith 13th by Prince of Wales, 151.

Devon Bulls and Produce.

Joseph Hilton, New Scotland, N. Y.; large gold medal; Prince of Wales 20th.

Devon Bulls, over Three Years Old.

Joseph Hilton, New Scotland, N. Y.; first prize, fifty dollars; Prince of Wales 20th, bred by exhibitor; calved December 12, 1878, sire Crown Prince, 434, dam Edith 9th by Prince of Wales, 151, gr. d. Fanny by Prince of Wales, 151.

Banker Brothers, Franklin Forks, Penn.; second prize, twenty-five dollars; Prince of Wales 19th, bred by Joseph Hilton, New Scotland, N. Y.; calved January 1, 1878, sire Prince of Wales 11th, 1101, dam Edith 5th by Prince of Wales, 151, gr. d. Edith 2d by Sachem, 1089.

Devon Bulls, Two Years Old.

Joseph Hilton, New Scotland, N. Y.; first prize, forty dollars; Prince Taurus, bred by exhibitor; calved January 19, 1883, sire Prince of Wales 20th, 1395, dam Edith 16th by Crown Prince, 434, gr. d. Edith 12th by Prince of Wales, 151.

A. F. Bronson, Vernon, N. Y.; second prize, twenty dollars; West Shore, bred by exhibitor; calved November 21, 1882, sire Jeddo. 1809, dam Lady Hartland by Litchfield, 789, gr. d. Esma by Tasso, 1163.

Devon Bulls, One Year Old.

Joseph Hilton, New Scotland, N. Y.; first prize, thirty dollars; Retainer, bred by exhibitor; calved January 2, 1884, sire Prince of Wales 20th, 1395, dam Edith 16th by Crown Prince, 434, gr. d. Edith 12th by Prince of Wales, 151.

Devon Bull Calves.

Jonathan Hoag, Tomhannock, N. Y.; first prize, ten dollars; Grand Union, bred by exhibitor; calved September 5, 1884, sire Forest King, 1828, dam Meta by Lord Lovell, 797, gr. d. Cherry 3d by Grant, 638.

Joseph Hilton, New Scotland, N. Y.; second prize, five dollars; Chancellor, bred by exhibitor; calved January 29, 1885, sire Prince of Wales 20th, 1395, dam Lady Jane Edith by Prince of Wales 20th, 1395, gr. d. Edith 14th by Crown Prince, 434.

Devon Cows, over Three Years Old.

Banker Brothers, Franklin Forks, Penn.; first prize, forty dollars; Bright Promise, bred by exhibitors; calved April 1, 1875, sire Prince of Wales 12th, 1002, dam Rose of Baltimore 3d by Comet, 420, gr. d. Rose of Baltimore 1st by Bloomfield, 313.

Joseph Hilton, New Scotland, N. Y.; second prize, twenty dollars; Edith 16th, bred by exhibitor; calved February 9, 1879, sire Crown Prince, 434, dam Edith 12th by Prince of Wales, 151, gr. d. Edith 4th by Prince of Wales, 151.

Devon Heifers, Two Years Old.

A. F. Bronson, Vernon, N. Y.; first prize, thirty dollars; Countess of Carnaby, bred by exhibitor; calved February 13, 1883, sire Jeddo, 1809, dam Victoria by Prince Albert Victor, 227½, gr. d. Maid of Honor by Hartland, 655.

Joseph Hilton, New Scotland, N. Y.; second prize, fifteen dollars; Maid of Utica, bred by exhibitor; calved September 25, 1882, sire Prince John H., 2458, dam Edith 12th by Prince of Wales, 151, gr. d. Edith 4th by Prince of Wales, 151.

Devon Heifers, One Year Old.

Joseph Hilton, New Scotland, N. Y.; first prize, twenty dollars; Princess of Wales, bred by exhibitor; calved October 27, 1883, sire Prince of Wales 20th, 1395, dam Edith 12th by Prince of Wales, 151, gr. d. Edith 4th by Prince of Wales, 151.

Joseph Hilton, New Scotland, N. Y.; second prize, ten dollars; Gipsy Queen, bred by exhibitor; calved June 2, 1884, sire Prince of Wales 20th, 1395, dam Mable Ensign by Zib, 2423, gr. d. Hollyberry by Doctor, 462.

Devon Heifer Calves.

Jonathan Hoag, Tomhannock, N. Y.; first prize, ten dollars; Princess Vera, bred by exhibitor; calved February, 1885, sire Fortune, 2250, dam Meg by Forest King, 1828, gr. d. Belmont by Otto, 1823.

Jonathan Hoag, Tomhannock, N. Y.; second prize, five dollars; Dorsey, bred by exhibitor; calved March 8, 1885, sire Fortune, 2250, dam Corinth by Grant, 638, gr. d. Eva by Bloomfield, 313.

HEREFORDS.

Hereford Herd.

Erastus Corning, Albany, N. Y.; large gold medal.

Bull, Kenwood, bred by exhibitor; calved December 20, 1882, sire Romeo, 6420, dam Comely by Sir Isaac, 6629, gr. d. Caroline by Chadnor 2d, 6634.

Cow, Filbert, bred by exhibitor; calved February 2, 1879, sire Comus, 6665, dam Princess 3d by Major, gr. d. Princess 2d by Washington (5134).

Cow, Edna, bred by exhibitor; calved February 9, 1879, sire Comus, 6665, dam Victoria 6th by Taurus, gr. d. Victoria 5th by S. Goddard.

Cow, Dorcas 5th, bred by Philip Turner, The Leen, Pembridge, England; calved March 31, 1880, sire Corsair, 4581, dam Dorcas 4th by Leominster, 2644, gr. d. Dorcas 3d by Bachelor, 8.

Cow, Filbert 2d, bred by exhibitor; calved January 4, 1882, sire Comus, 6665, dam Filbert by Comus, 6665, gr. d. Princess 3d by Major.

Heifer, Baby, bred by exhibitor; calved November 6, 1882, sire Comus, 6665, dam Marchioness 2d by Major, gr. d. Marchioness by Washington (5134).

Hereford Bulls and Produce.

Erastus Corning, Albany, N. Y.; large gold medal, Comus.

Hereford Bulls, over Three Years Old.

Erastus Corning, Albany, N. Y.; first prize, fifty dollars; Comus, bred by P. Turner, Pembridge, England; calved July 21, 1872, sire Provost (4067), dam Kathleen by Bolingbroke (1883), gr. d. Redwing by Felix (953).

Hereford Bulls, Two Years Old.

Erastus Corning, Albany, N. Y.; first prize, forty dollars; Kenwood, bred by exhibitor; calved December 20, 1882, sire Romeo, 6420, dam Comely by Sir Isaac, 6629, gr. d. Caroline by Chadnor 2d, 6634.

George N. Bissell, Milford, N. Y.; second prize, twenty dollars; Star of the Vale 4th, bred by E. Grasett, Craven Arms, England; calved August 31, 1883, sire Hartington, 4010, dam Satin 3d by Spark 5th, 3355, gr. d. Satin 2d by Pirate, 3356.

Hereford Bulls, One Year Old.

George N. Bissell, Milford, N. Y.; first prize, thirty dollars; Chevalier, bred by William Tudge, Ludlow, England; calved September 23, 1883, sire Auctioneer, 9572, dam Cinderella by Cannonball, 8352, gr. d. Cobweb by Defence, 8353.

Erastus Corning, Albany, N. Y.; second prize, fifteen dollars; Parker, bred by exhibitor; calved December 4, 1883, sire Comus, 6665, dam Dorcas 5th by Corsair (5271), gr. d. Dorcas 4th by Leominster (3910).

Hereford Bull Calves.

George N. Bissell, Milford, N. Y.; first prize, ten dollars; Jimmy Cox, bred by exhibitor; calved October 16, 1884, sire Kenwood, 12492, dam Edna 2d by Comus, 6665, gr. d. Edna by Comus, 6665.

Hereford Cows, over Three Years Old.

Erastus Corning, Albany, N. Y.; first prize, forty dollars; Filbert, bred by exhibitor; calved February 2, 1879, sire Comus, 6665, dam Princess 3d by Major, gr. d. Princess 2d by Washington (5134).

George N. Bissell, Milford, N. Y.; second prize, twenty dollars; Echo, bred by Erastus Corning, Albany, N. Y.; calved January 22, 1880, sire Comus 6665, dam Marchioness 2d by Major, gr. d. Marchioness by Washington (5134).

Hereford Heifers, Two Years Old.

Erastus Corning, Albany, N. Y.; first prize; thirty dollars; Baby, bred by exhibitor; calved November 6, 1882, sire Comus, 6665, dam Marchioness 2d by Major, gr. d. Marchioness by Washington (5134).

George N. Bissell, Milford, N. Y.; second prize, fifteen dollars; Downton Buttercup, bred by T. Fenn, Ludlow, England; calved July 12, 1883, sire Auctioneer, 9572, dam Buttercup 3d by Kingstone, 5203, gr. d. Buttercup by Avon, 1670.

Hereford Heifer Calves.

George N. Bissell, Milford, N. Y.; first prize, ten dollars; Pansy Blossom bred by exhibitor; calved November 14, 1884, sire Kenwood, 12492, dam Ruby by Comus, 6665, gr. d. Princess 3d by Major.

AYRSHIRES.

Ayrshire Herd Prize.

George H. Bell, Rome, N. Y.; large gold medal.

Bull, Winfield 3d, red and white, bred by exhibitor; calved March 17, 1882, sire Winfield Boy, 2610, dam Draxy Miller by Treasurer, 1509, gr. d. Pet by Rob Roy, 325.

Cow, Maggie Mitchell, white and red, bred by S. Dering, Utica, N. Y.; calved August 15, 1875, sire The General, 1498, dam Draxy Miller by Treasurer, 1509, gr. d. Pet by Rob Roy, 325.

Cow, Daisy Tresham, red and white, bred by S. Dering, Utica, N. Y.; calved April 20, 1878, sire Kilmarnock 2d, 2611, dam Kate Tresham, by Norval, 762, gr. d. Pet by Rob Roy, 325.

Cow, Lillie, red and white, bred by S. Dering, Utica. N. Y.; calved April 24, 1878, sire Kilmarnock 2d, 2611, dam Draxy Miller, by Treasurer, 1509, gr. d. Pet by Rob Roy, 325.

Heifer, Pride of Rome, red and white, bred by exhibitor; calved September 5, 1882, sire Winfield Boy, 2610, dam Maggie Mitchell 3d by Gansevoort, 2612, gr. d. Maggie Mitchell by The General, 1498.

Heifer, Maggie Mitchell 5th, red and white, bred by exhibitor; calved September 27, 1882, sire Winfield Boy, 2610, dam Maggie Mitchell, 2d by Kilmarnock 2d, 2611, gr. d. Maggie Mitchell by The General 1498.

Ayrshire Bulls and Produce.

George A. Fletcher, Milton, Mass.; large gold medal; Glencarne, dark red and white, bred by Herbert Merriam, Weston, Mass.; calved April 25, 1876, sire Lord Avondale 1268, dam Lilly Dale by Tarbolton 372, gr. d. White Lily, imported 1853, by Hungerford & Brodie, Adams, N. Y.

Ayrshire Bulls, over Three Years Old.

J. F. Converse, Woodville, N. Y.; first prize, fifty dollars; Major Drummond, red, bred by James Drummond, Montreal, Canada; calved March 22, 1876, sire Sir Roger, 868, dam Medora, imported by James Drummond.

George H. Bell, Rome, N. Y.; second prize, twenty-five dollars; Winfield 3d, red and white, bred by exhibitor; calved March 17, 1882, sire Winfield Boy, 2610, dam Draxy Miller by Treasurer, 1509, gr. d. Pet by Rob Roy, 325.

Ayrshire Bulls, Two Years Old.

A. D. Harrington, Oxford, N. Y.; first prize, forty dollars; Ayr Douglas 2d, red and white, bred by C. M. Winslow, Brandon, Vt.; calved April 7, 1883, sire Ayr Douglas, 2865, dam Rosa by Duke of Hartford, 521, gr. d. Rose by Antarctic, 1551.

B. G. Foster, Vernon, N. Y.; second prize, twenty dollars; Charles Mars of Vernon, dark red with white spots, bred by Ormiston Brothers, Cuba, N. Y.; calved April 6, 1883, sire Mars 1st, 277, dam Maggie Lauder by Joe Mars, 2856, gr. d. Lady Kirkwood 2d by Duke of Buccleuch, 1091.

Ayrshire Bulls, One Year Old.

A. D. Harrington, Oxford, N. Y.; first prize, thirty dollars; Bernardo, dark red and white, bred by exhibitor; calved April 15, 1884, sire Prince Charley 2d, 2808, dam Libby Hawks by Mikado, 2251, gr. d. Grace Hawks by Peveral, 770.

J. F. Converse, Woodville, N. Y.; second prize, fifteen dollars; Prince Drummond, red and white, bred by exhibitor; calved March 30, 1884, sire Major Drummond, 2006, dam Cora Fearnot by Fearnot, 1134, gr. d. Winnie 2d by Fearnot, 1134.

Ayrshire Bull Calves.

Stryker & Jones, Rome, N. Y.; first prize, ten dollars; Wilson 3d, dark red and white, bred by exhibitor; calved April 1, 1885, sire Wilson 2d, 2926, dam Princess of H. by Mars 1st, 2177, gr. d. Princess Louise, imported in 1873, by Jardine & Sons, Hamilton, Canada.

A. D. Harrington, Oxford, N. Y.; second prize, five dollars; Gil Ford, red and white, bred by exhibitor; calved April, 1885, sire Prince Charley 2d, 2808, dam Dolly J. by Camper, 2609, gr. d. Julia by Ploughboy, 775.

Ayrshire Cows, over Three Years Old.

George A. Fletcher, Milton, Mass.; first prize, forty dollars; Lady Essex 4th, white and red, bred by Herbert Merriam, Weston, Mass.; calved August 3, 1876, sire Lord Douglas, 1283, dam Lady Essex by Bruce, 453, gr. d. Lassie by Baldy, 90.

George H. Bell, Rome N. Y.; second prize, twenty dollars; Daisy Tresham, red and white, bred by S. Dering, Utica, N. Y.; calved April 20, 1877, sire Kilmarnock 2d, 2611, dam Kate Tresham by Norval, 762, gr. d. Pet by Rob Roy, 325.

Ayrshire Heifers, Two Years Old.

B. G. Foster, Vernon, N. Y.; first prize, thirty dollars; Beauty of Vernon, red and white spotted, bred by exhibitor; calved April 25, 1883, sire King Vernon, 2616, dam Belle of Vernon by Hugo, 2323, gr. d. Pet Brown by The General, 1498.

George H. Bell, Rome, N. Y.; second prize, fifteen dollars; Maggie Mitchell 5th, red and white, bred by exhibitor; calved September 27, 1882, sire Winfield Boy, 2610, dam Maggie Mitchell 2d by Kilmarnock 2d, 2611, gr. d. Maggie Mitchell by The General, 1498.

Ayrshire Heifers, One Year Old.

E. H. Barney, Milford, N. Y.; first prize, twenty dollars; Nettie, red and white, bred by exhibitor; calved July 6, 1884, sire Linden Lad 3d, 3445, dam Queen Bess 2d by Billy Boy, 1859, gr. d. Queen Bess by Wallace of Milford, 1858.

George H. Bell, Rome, N. Y.; second prize, ten dollars; Ethel B., red and white, bred by exhibitor; calved January 19, 1884, sire Winfield 3d, dam Lillie by Kilmarnock 2d, 2611, gr. d. Draxy Miller by Treasurer, 1509.

Ayrshire Heifer Calves.

George H. Bell, Rome, N. Y.; first prize, ten dollars; Daisy Tresham 5th, red and white, bred by exhibitor; calved February 27, 1885, sire Winfield 3d, dam Daisy Tresham 2d by Winfield Boy, 2610, gr. d. Daisy Tresham by Kilmarnock 2d, 2611.

A. D. Harrington, Oxford, N. Y.; second prize, five dollars; Gertie H., dark red with white spots, bred by exhibitor; calved February, 1885, sire Prince Charley 2d, 2808, dam Lady Corcoran by Kilmarnock 25th, 2329, gr. d. Tioga Belle by Sir Jock 2d, 1217.

HOLSTEINS.

Holstein Bulls, over Three Years Old.

Theodore Drew, Vernon, N. J.; first prize, fifty dollars; Tusken, white and black, bred by T. C. Maxwell & Brothers, Geneva, N. Y.; calved May 15, 1881, sire Jubilee, 276, dam Pasteleintje 2d, imported November, 1879, by George E. Brown & Co., Aurora, Ill.

Stryker & Jones, Rome, N. Y.; second prize, twenty-five dollars; Groote Pier, white and black, bred by S. Hoxie, Whitestown, N. Y.; calved March 2, 1882, sire Paul Twisk, 22, dam Bakker, imported by Unadilla Valley Stock Breeding Association, West Edmeston, N. Y.

Holstein Bulls, Two Years Old.

C. L. G. Blessing, Slingerlands, N. Y.; first prize, forty dollars; Lubbert King of Friesland, black and white, bred by S. Sijarda, Friesland; calved May 25, 1883, imported May 23, 1884, by exhibitor.

H. C. Spengler, Chatham Centre, N. Y.; second prize, twenty dollars; Bonice, black and white; calved March 27, 1883, imported November 1, 1882, in dam Raadslid 2d, by A. Bradley, Lee, Mass.

Holstein Bulls, One Year Old.

J. H. Gardner, Guilderland Station, N. Y.; first prize, thirty dollars; Helder's Fritz, black and white; calved March 20, 1884, sire Helder's Nicholaas 3d, 275, imported 1885, by Roberts, Durnall & Hicks, Westchester, Penn., in dam Hoorn.

E. Sweet, Albany, N. Y.; second prize, fifteen dollars; Nantasket, black and white, bred by G. W. Horr, Wellington, Ohio; calved May 28, 1884, sire Syracuse, 822, dam Jannek 3d by Uncle Tom, 163, gr. d. Netherland Queen 2d by Uncle Tom, 163.

Holstein Bull Calves.

Stryker & Jones, Rome, N. Y.; first prize, ten dollars; St. Leco, black and white, bred by exhibitors; calved December 16, 1884, sire Chenango Boy, 679, dam Lady of Oneida by 4th Prince of Orange, 246, gr. d. Lea, imported, in 1874, by John H. Comer, Goshen, N. Y.

Van Dreser Brothers, Cobleskill, N. Y.; second prize, five dollars; Schiller, black and white, bred by exhibitors; calved January 29, 1885, sire 102 Wijndert, dam Hinke by 26 Mooie, gr. d. Winkje, imported by Unadilla Valley Association.

Holstein Cows, over Three Years Old.

C. L. G. Blessing, Slingerlands, N. Y.; second prize, twenty dollars; Belle of Shelter Grove, black and white, bred by T. C. Maxwell & Brothers, Geneva, N. Y.; calved April 22, 1882, sire Milk Boy, 701, dam Bride 2d by Ebbo, 236, gr. d. Bride by 5th Prince of Orange, 243.

Holstein Heifers, Two Years Old.

C. L. G. Blessing, Slingerlands, N. Y.; first prize, thirty dollars; Halqui, black and white, bred by H. S. Bartlema, Friesland; calved March 28, 1883, imported May 23, 1884, by exhibitor.

Holstein Heifers, One Year Old.

C. L. G. Blessing, Slingerlands, N. Y.; first prize, twenty dollars; Lucequi, black and white, bred by exhibitor; calved February 1, 1884, sire Jamie, 1228, dam Van Sheltinga 2d, imported by exhibitor.

Stryker & Jones, Rome, N. Y.; second prize, ten dollars; Lady of Rome, black and white, bred by exhibitors; calved September 1, 1884, sire Chenango Boy, 679, dam Niobe 2d by Rubenstein, 450, gr. d. Niobe by 4th Prince of Orange, 246.

Holstein Heifer Calves.

Van Dreser Brothers, Cobleskill, N. Y.; first prize, ten dollars; Huebsche, black and white, bred by exhibitors; calved April 4, 1885, sire Prince Andy, 307, dam Lady Van by 102 Wijndert, gr. d. Tjirk by 26 Mooie.

C. L. G. Blessing, Slingerlands, N. Y.; second prize, five dollars; Petqui 2d, black and white, bred by exhibitor; calved March 23, 1885, sire Lubbert King of Friesland, 3384, dam Petqui, imported, May 23, 1884, by exhibitor.

JERSEYS.

Jersey Herds.

Houghton Farm, Mountainville, N. Y.; large gold medal.

Bull, Ramapo, silver gray and black, bred by A. B. Darling, Ramsey's, N. J.; calved October 3, 1879, sire Miletus, 3186, dam Eurotas by Rioter 2d, 469, gr. d. Europa by Jupiter, 93.

Cow, Myra 2d, brown fawn, bred by Thomas H. Faile, West Farms, N. Y.; calved March 21, 1876; sire Trusty, 1101, dam Myra by Dolphin 2d, 468, gr. d. Edith 4th by Mars, 95.

Cow, Mercedella, solid color, bred by Lawson Valentine, Mountainville, N. Y.; calved January 19, 1882, sire Ramapo, 4679, dam Catholique, imported July 8, 1878, by L. Valentine.

Heifer, Marapo, brown, bred by exhibitor; calved October 18, 1882; sire Ramapo, 4679, dam Maria, imported, in 1881, by W. R. McCready, Saugatuck, Conn.

Heifer, Valley Lass, brown, bred by exhibitor; calved November 10, 1882, sire Ramapo, 4679, dam Valley Lady by Lord Houghton, 3287, gr. d. Valley Queen, imported, July 8, 1878, by Lawson Valentine, Mountainville, N. Y.

Heifer, Moodna Maid, French gray, bred by exhibitor; calved March 26, 1883, sire Ramapo, 4679, dam Moodna Girl, imported, 1878, in dam Perry Farm Maid, by E. P. P. Fowler.

Jersey Bulls, and Produce.

Houghton Farm, Mountainville, N. Y.; large gold medal, Ramapo.

Jersey Bulls, Three Years Old.

Houghton Farm, Mountainville, N. Y.; first prize, fifty dollars; Ramapo, silver gray and black, bred by A. B. Darling, Ramsey's, N. J.; calved October 3, 1879, sire Miletus, 3186, dam Eurotas by Rioter 2d, 469, gr. d. Europa by Jupiter, 93.

Edward L. Clarkson, Tivoli, N. Y.; second prize, twenty-five dollars; Young Duke of Darlington, steel gray, bred by W. A. Mullin, Mount Holly Springs, Penn.; calved February 8, 1882, sire Duke of Darlington, 2460, dam Lady Vermont by Noble 2d (256), gr. d. Miss Vermont, imported September 28, 1878, by E. P. P. Fowler, Southampton, England.

Jersey Bulls, Two Years Old.

W. R. Mowry, Oxford, N. Y.; first prize, forty dollars; St. Helier Signal, gray, bred by S. B. Wheeler, Bridgeport, Conn.; calved May 28, 1883, sire Wandeffie, 8219, dam Kaoli by Oxoli, 1922, gr. d. Kalmia by St. Helier, 45.

Edward L. Clarkson, Tivoli, N. Y.; second prize, twenty dollars; King Koffee's Son, orange fawn, bred by exhibitor; calved May 14, 1883, sire King Koffee, 5522, dam Beauty of Clermont by Referee, 3603, gr. d. Tamy 2d by Optimus, 1607.

Jersey Bulls, One Year Old.

John McEwan, Albany, N. Y.; first prize, thirty dollars; Malta, bred by estate of M. Y. Tilden, New Lebanon, N. Y.; calved February 8, 1884, sire Æneas of Graystone, 7359, dam Gazelle, imported in 1875, by M. Y. Tilden.

Lewis S. Wisner, Middletown, N. Y.; second prize, fifteen dollars; Linden of Orange, bred by T. S. Cooper, Coopersburg, Penn.; calved June 8, 1884, sire Black Prince of Linden, 9063, dam Georgiana 2d, imported July 16, 1883, by T. S. Cooper.

Jersey Bull Calves.

Houghton Farm, Mountainville, N. Y.; first prize, ten dollars; Virginia Mugwump, French gray, bred by Exhibitor; calved September 17, 1884, sire, Ramapo, 4679, dam Tulip, imported in 1881, by W. R. McCready, Saugatuck, Conn.

Cyrus Cole, Albany, N. Y.; second prize, five dollars; Excelsior, light fawn, bred by J. K. Emmet, Albany, N. Y.; calved March 26, 1885, sire Ouidinot's Cicero, 8187, dam Detta of Brookside by Earl of Brookside, 1677, gr. d. Detta 3d by Wethersfield, 966.

Jersey Cows, over Three Years Old.

Houghton Farm, Mountainville, N. Y.; first prize, forty dollars; Mercedella, solid color, bred by L. Valentine, Mountainville, N. Y.; calved January 19, 1882, sire Ramapo, 4679, dam Catholique, imported July 8, 1878, by L. Valentine.

Edward L. Clarkson, Tivoli, N. Y.; second prize, twenty dollars; Blue Bell of Jersey, squirrel gray, bred by Thomas Vautier, St. Ouens, Jersey; calved February 1, 1877, imported March 1, 1879, by E. P. P. Fowler, Southampton, England.

Jersey Heifers, Two Years Old.

T. R. Proctor, Utica, N. Y., first prize, thirty dollars; Proctor's Regina, light fawn, bred by exhibitor; calved April 29, 1883, sire Cetewayo (224), dam Gazelle (1941).

W. R. Mowry, Oxford, N. Y.; second prize, fifteen dollars; Queen Carolina, cream fawn; calved February 16, 1883, imported May, 1884, by Edward Burnett, Southborough, Mass.

Jersey Heifers, One Year Old.

T. R. Proctor, Utica, N. Y.; first prize, twenty dollars; Miss Alexandre 2d, dark fawn, bred by T. A. Havemeyer, Mahwah, N. J.; calved December 4, 1883, sire Carlo, 5559, dam Miss Alexandre, imported in August, 1881, by T. A. Havemeyer.

E. J. Larrabee, Albany, N. Y.; second prize, ten dollars; Alice Hugo Pogis, bred by J. S. Howt, Whycocomah, N. S.; calved February 23, 1884, sire Laird of Draffan, 5922, dam Cowslip of St. Lambert by Stoke Pogis 3d, 2238, gr. d. Witch of St. Lambert by Lord Lisgar, 1066.

Jersey Heifer Calves.

Mapleshade Stock Farm, Millbrook, N. Y.; first prize, ten dollars; Golden Musique, fawn, bred by John D. Wing, Millbrook, N. Y.; calved January 26, 1885, sire Golden Cloud, 9481, dam Zulu Maid by Cetewayo (224.)

Erastus Corning, Albany, N. Y.; second prize, five dollars; Hibertie, fawn, bred by exhibitor; calved February 18, 1885, sire Oudinot's Cicero, 8187, dam Maid of St. Ouens 2d by Stockwell 3d, 2770, gr. d. Maid of St. Ouens, imported September 29, 1873, by exhibitor.

GUERNSEYS.

Guernsey Bulls, over Three Years Old.

Nutting Brothers, Woodville, N. Y.; first prize, fifty dollars; Og, fawn and white, bred by E. Norton, Farmington, Conn.; calved April 19, 1878, sire Mallbrook 23, dam Princess, imported in April, 1876, by M. C. Weld, New York.

Guernsey Bulls, One Year Old.

W. C. Wing, West Laurens, N. Y.; first prize, thirty dollars; King Richard, orange fawn and white, bred by exhibitor; calved September 23, 1883, sire Silver Fern, 276, dam Butterhorn, imported August 24, 1882, by S. L. Hoxie, South Edmeston, N. Y.

Guernsey Cows, over Three Years Old.

W. C. Wing, West Laurens, N. Y.; first prize, forty dollars; Princess Maud, orange fawn and white, bred by Thomas Roussel, The Vale, Guernsey, calved January 6, 1881, imported August 24, 1882, by S. L. Hoxie, South Edmeston, N. Y.

Guernsey Heifers, One Year Old.

W. C. Wing, West Laurens, N. Y.; first prize, twenty dollars; Princess Maud 2d, orange fawn and white, bred by exhibitor; calved July 20, 1884, sire Roussel, 726, dam Princess Maud, imported August 24, 1882, by S. L. Hoxie, South Edmeston, N. Y.

BROWN SWISS.

Brown Swiss Herds.

John B. Eldredge, Middle Falls, N. Y.; large gold medal.

Bull, Bonaparte, dark brown, bred by G. Burgi in Switzerland; calved January 10, 1883, imported by exhibitor.

Cow, Hirsch, brown, bred by G. Burgi in Switzerland; calved November 10, 1878, imported by exhibitor.

Cow, Schoni, brown, bred by G. Burgi in Switzerland; calved May 30, 1879, imported by exhibitor.

Cow, Eva Burgi, brown, bred by G. Burgi, in Switzerland; calved May 26, 1880, imported by exhibitor.

Cow, Elesa Burgi, brown, bred by G. Burgi in Switzerland; calved May 15, 1881, imported by exhibitor.

Cow, May Burgi, brown, bred by G. Burgi in Switzerland; calved May 20, 1881, imported by exhibitor.

Brown Swiss Bulls of any Age.

John B. Eldredge, Middle Falls, N. Y.; first prize, forty dollars; Bonaparte, dark brown, bred by G. Burgi in Switzerland, calved January 10, 1883, imported by exhibitor.

Brown Swiss Cows or Heifers of any Age.

John B. Eldredge, Middle Falls, N. Y.; first prize, forty dollars; Schoni, brown, bred by G. Burgi in Switzerland; calved May 30, 1879, imported by exhibitor.

NORFOLK AND SUFFOLK RED POLLED.

Norfolk and Suffolk Red Polled Herds.

G. F. Taber, Patterson, N. Y.; large gold medal.

Bull, Francillo, bred by J. J. Colman, Norwich, England; calved January, 13, 1882, sire Charles, 469, dam Fan by Roundhead, 180, gr. d. Fanny by Hero 3d, 87.

Cow, Tillie, bred by exhibitor; calved June 24, 1878, sire Champion 271, dam Theresa by Sampson, 192, gr. d. Twinny by Hero 3d, 87.

Cow, Pond Lily 2d, bred by J. Rivett, Norfolk, England; calved 1880, sire Falstaff, 303, dam a Pond cow.

Cow, Lucretia, bred by exhibitor; calved September 18, 1881, sire Champion, 271, dam Ravinewood Lass by Robin, 176, gr. d. Nelly by Hero 2d, 86.

Heifer, Mayflower, bred by exhibitor; calved May 15, 1884, sire Mason, 698, dam May by Ravinewood Beau, 160, gr. d. Ocean Maid by Hero 3d, 87.

Heifer, Christina 4th, bred by exhibitor; calved July 1, 1884, sire Champion, 271, dam Christina by Rufus, 188, gr. d. Cauliflower 3d by Shylock, 196.

Norfolk and Suffolk Red Polled Bulls of any Age.

G. F. Taber, Patterson, N. Y.; first prize, forty dollars; Francillo, bred by J. J. Colman, Norwich, England; calved January 13, 1882, sire Charles, 469, dam Fan by Roundhead, 180, gr. d. Fanny by Hero 3d, 87.

Norfolk and Suffolk Red Polled Cows or Heifers of any Age.

G. F. Taber, Patterson, N. Y.; first prize, forty dollars; Spinster, bred by J. Howling, Elmham, England; calved February 9, 1880, sire Brutus, 269, dam Sprite by Rufus, 188, gr. d. Spot.

FAT CATTLE.

Fat Cows, over Four Years Old.

Thomas Boak & Son, Gerry, N. Y.; first prize, thirty dollars; Fairmaid (shorthorn), roan, bred by exhibitors; calved April 22, 1880, sire High Sheriff 3d, 60023, dam Farewell by Royal Westmoreland (35416), gr. d. General's Daughter by General Haynau (11520).

HORSES.

BREEDING AND GROWING STOCK — CLYDESDALES.

Special Prize for the Best Stallion of any age, large gold medal.

George N. Bissell, Milford, N. Y.; Billy Boylston, foaled July 31, 1883; sire Boylston Boy (111), dam Nell by Scotland's Glory (845), gr. d. Minette by Young Beaconsfield (73).

Stallions, over Four Years Old.

Henry Philpot, Hoosick, N. Y.; second prize, twenty-five dollars; Young Enterprise, black, 16.2, foaled May, 1875; sire Enterprise, dam by Royal Prince of Wales.

Stallions, Two Years Old.

George N. Bissell, Milford, N. Y.; first prize, thirty dollars; Billy Boylston, foaled July 31, 1883; sire Boylston Boy (111), dam Nell by Scotland's Glory (845), gr. d. Minette by Young Beaconsfield (73).

Fillies, Three Years Old.

Thomas Boak & Son, Gerry, N. Y.; first prize, thirty dollars; Nettie, bred by L. Bloodworth, Oakville, Canada, foaled July 4, 1882; sire Rob Roy, dam Doll by imported Dominion, gr. d. Bess by Hardfortune.

PERCHERONS.

Special Prize for the Best Stallion of any age, large gold medal.

John W. Akin, Scipio, N. Y.; Genitor, bay, 16.3, 7 years, imported August 28, 1883; sire Favora, 1542, dam Rosette by Bayard.

Stallions, over Four Years Old.

John W. Akin, Scipio, N. Y.; first prize, fifty dollars; Genitor, bay, 16.3, 7 years, imported, August 28, 1883; sire Favora, 1542, dam Rosette, by Bayard.

U. E. Blatchley, Great Bend, Penn.; second prize, twenty-five dollars; Boullay, dapple gray, 16.2, bred by Ernest Periot, Cheneliere, France, foaled May, 1880; sire Brilliant, dam Rosette by Brilliant.

Stallions, Three Years Old.

Elwood S. Akin, Scipio, N. Y.; first prize, forty dollars; Dude, gray, 15.3, imported in 1883 by John W. Akin, Scipio, N. Y.

John W. Akin, Scipio, N. Y.; second prize, twenty dollars; Orizaba, black, imported in 1884 by exhibitor; sire Negro, dam Roleau by Romulus.

Stallions, Two Years Old.

John W. Akin, Scipio, N. Y.; first prize, thirty dollars; Favori, dark gray, imported in 1884 by exhibitor; sire Favori, dam Margot.

C. D. Sickler, Malta, N. Y.; second prize, fifteen dollars; Moumour, black, 15.3, imported by Henry C. Slocum, Scipio, N. Y.; sire Madere, dam Rose.

Stallions, One Year Old.

Elwood S. Akin, Scipio, N. Y.; first prize, twenty dollars; Brilliant, gray, 15, imported in 1884 by John W. Akin, Scipio, N. Y.; sire Romulus, dam Marott by Salim.

John W. Akin, Scipio, N. Y.; second prize, ten dollars; St. Laurent, black, imported in 1884 by exhibitor; sire Docile, dam Lizzie by Favora (725).

Mares, over Four Years Old.

John W. Akin, Scipio, N. Y.; first prize, forty dollars; Empress, black, 6 years, imported in 1883 by exhibitor; sire Le Duc, dam Rosette by Mouton.

Elwood S. Akin, Scipio, N. Y.; second prize, twenty dollars; Josephine, gray, 16, 5 years, imported in 1883 by John W. Akin, Scipio, N. Y.; sire Picadore, dam Josephine.

Fillies, Three Years Old.

John W. Akin, Scipio, N. Y.; first prize, thirty dollars; Pelote, dark gray, 16.1, bred by exhibitor; sire Lamoreux, dam Rosette by Solid,

Fillies, Two Years Old.

Elwood S. Akin, Scipio, N. Y.; first prize, twenty dollars; Monica, gray, 16, imported in 1883 by John W. Akin, Scipio, N. Y.; sire Cheri, 18, dam Frisette.

Fillies, One Year Old.

Elwood S. Akin, Scipio, N. Y.; first prize, fifteen dollars; Lamott, gray, 15, imported in 1884 by John W. Akin, Scipio, N. Y.; sire Passe Partout (394), dam Miton by Mouton (1650).

John W. Akin, Scipio, N. Y.; second prize, five dollars; Lina, black, imported in 1884; sire Docile, dam Lafette.

CARRIAGE AND COACH HORSES.

Stallions, over Four Years Old.

George C. Genet, Greenbush, N. Y.; first prize, fifty dollars; Hathorn, bay, 16.2; sire Thorndale, dam by a son of Mambrino Chief.

A. B. Larkin, Warnerville, N. Y.; second prize, twenty-five dollars; Broro, brown, 16, 10 years; sire a son of Mambrino Chief, dam by Mambrino Chief.

Stallions, Three Years Old.

Frank Brownell, Castile, N. Y; first prize, forty dollars; brown, 17; sire an English draught horse, dam a Clydesdale mare.

Stallions, Two Years Old.

Thomas S. Flood, Elmira, N. Y.; first prize, thirty dollars; Floodwood, bay, bred by exhibitor; sire Wood's Hambletonian, dam Maria by Panic (son of Glencoe), gr. d. Jessemine Porter by imported Australian.

Dennis R. Harder, Nassau, N. Y.; second prize, fifteen dollars; Duke of Chester, dark brown, 14.3½, foaled July 3, 1883; sire Duke of Perche, Jr. (Percheron), dam a Hambletonian mare.

Stallions, One Year Old.

Alden Goldsmith, Washingtonville, N. Y.; first prize, twenty dollars; bay, 15.2; sire a son of Chester Chief, dam Miss Bendell by Volunteer.

Mares, over Four Years Old.

Alden Goldsmith, Washingtonville, N. Y.; first prize, forty dollars; Hattie Bright, bay, 7 years; sire John Bright, dam by White Eagle, gr. d. by Boanerges.

Fillies, Two Years Old.

Alden Goldsmith, Washingtonville, N. Y.; first prize, twenty dollars; Charm, bay, 15.2, foaled June 2, 1883; sire Castleton, dam by Gentle Breeze, gr. d. by Gill's Vermont.

Fillies, One Year Old.

Alden Goldsmith, Washingtonville, N. Y.; first prize, fifteen dollars; b bay, foaled May 18, 1884; sire Volunteer, dam Madaline by Goldsmith's Abdallah, gr. d. by New York Beauty.

ROADSTERS.

Special Prize for the Best Stallion of any age, large gold medal.

Erastus Corning, Albany, N. Y.; Shawmut, bay, 15.3, 8 years, bred by Edwin Thorne, Millbrook, N. Y.; sire Harry Clay, dam Heroine by Rysdyk's Hambletonian, gr. d. Lady Patriot by Patriot.

Stallions, over Five Years Old.

Erastus Corning, Albany, N. Y.; first prize, seventy dollars; Shawmut, bay, 15.3, 8 years, bred by Edwin Thorne, Millbrook, N. Y.; sire Harry Clay, dam Heroine by Rysdyk's Hambletonian, gr. d. Lady Patriot by Patriot.

John Warner, Greenbush, N. Y.; second prize, thirty-five dollars; Ironsides, brown, 15.2, 11 years; sire Administrator, dam Preceptress by Strader's Cassius M. Clay, gr. d. by Bertrand.

Stallions, Four Years Old.

D. S. Hill, Sidney Plains, N. Y.; first prize, sixty dollars; Early Bird, bay, 15.3, bred by exhibitor, foaled May 16, 1881; sire Victor, Jr., dam Maggie Clark by Owego Chief.

Stallions, Three Years Old.

John W. Lawyer, Schoharie, N. Y.; first prize, fifty dollars; Dan, dark chestnut, 16, foaled June 17, 1882; sire Schoharie Lambert, dam Nell by Paragon, gr. d. Nellie by Mambrino Chief.

John Warner, Greenbush, N. Y.; second prize, twenty-five dollars; Texas Star, chestnut, 15.1½; sire Hambletonian Prince, dam Rittie Mosher by Ethan Allen.

Stallions, Two Years Old.

Alden Goldsmith, Washingtonville, N. Y.; first prize, forty dollars; brown, 15.2, foaled August 9, 1883; sire Carlyle, dam Nora by Peacemaker, gr. d. Nell's Star by American Star.

Guy Miller, Chester, N. Y.; second prize, twenty dollars; McKean, bay, foaled May 11, 1883, bred by exhibitor; sire Goldsmith's Volunteer, dam Meg Merrilies by Ethan Allen, gr. d. by Saltram.

Stallions, One Year Old.

Alden Goldsmith, Washingtonville, N. Y.; first prize, thirty dollars; brown, 15, foaled June, 1884; sire Volunteer, dam Ablet by Pacing Abdallah, gr. d. Hamletta by Hamlet.

Charles W. Little, Albany, N. Y.; second prize, fifteen dollars; brown; sire Ironsides by Adminstrator.

Mares, over Four Years Old.

Thomas S. Flood, Elmira, N. Y.; first prize, fifty dollars; Minnie Edsall, chestnut, 7 years; sire Major Edsall, dam Star by Magnolia.

John W. Lawyer, Schoharie, N, Y.; second prize, twenty-five dollars; Nellie, chestnut, 16, 9 years; sire Paragon, dam by Mambrino Chief.

Fillies, Three Years Old.

Alden Goldsmith, Washingtonville, N. Y.; first prize, forty dollars; India, bay, 15.2; sire Heptagon, dam by American Ethan Allen, gr. d. by Biggart's Rattler.

Erastus Corning, Albany, N. Y,; second prize, twenty dollars; Marjorie, bay, sire Shawmut, dam Mistress by Corning's Harry Clay, gr. d. Maori by Australian.

Fillies, Two Years Old.

Charles W. Little, Albany, N. Y.; first prize, thirty dollars; brown, 15; sire Ironsides by Administrator.

D. S. Hill, Sidney Plains, N. Y.; second prize, fifteen dollars; Edith, bay, 15, bred by exhibitor, foaled July 15, 1883; sire Harry Hill, dam Maggie Clark by Owego Chief.

Fillies, One Year Old.

Alden Goldsmith, Washingtonville, N. Y.; first prize, twenty dollars; bay, 14.2; sire Heptagon, dam Ella Atwood by Abdallah Messenger, gr. d. by Wagner.

D. S. Hill, Sidney Plains, N. Y.; second prize, ten dollars; Roxy H, black, 14.1, bred by exhibitor, foaled June 1, 1884; sire Early Bird, dam Betty.

SHETLAND PONIES.

Stallions, over Two Years Old.

F. A. Converse, Woodville, N. Y.; first prize, twenty dollars.

Stallions, under Two Years Old.

J. F. Converse, Woodville, N. Y.; first prize, fifteen dollars.

Mares, over Two Years Old.

F. A. Converse, Woodville, N. Y.; first prize, twenty dollars.

J. F. Converse, Woodville, N. Y.; second prize, ten dollars.

Fillies, under Two Years Old.

J. F. Converse, Woodville, N. Y.; first prize, fifteen dollars.

HARNESS AND SADDLE HORSES.

Draught Pairs.

John W. Akin, Scipio, N. Y.; first prize, fifty dollars; Percheron mares, 16.3, imported by exhibitor; Mignonette, white, 9 years; Laponte, brown, 6 years.

Francis Bradt, Jerusalem, N. Y.; second prize, twenty-five dollars; bay mares, 15.2 and 16, 7 and 6 years.

Coach Pairs.

Erastus Corning, Albany, N. Y.; first prize, fifty dollars; bay geldings, 16, 8 and 9 years.

J. H. Van Arsdale, Castile, N. Y.; second prize, twenty-five dollars; bay geldings, 16.2, 5 years.

Phæton Pairs.

W. M. Potter, Oneonta, N. Y.; first prize, fifty dollars; mare and gelding, bays, 15.2, 5 and 6 years.

S. J. Burton, Westville, N. Y.; second prize, twenty-five dollars; bays, 15.2½, gelding 5 years, mare 4 years; sire Hambletonian Prince, 819.

Coupé Horses.

W. M. Potter, Oneonta, N. Y.; first prize, thirty dollars; gray gelding, 16.3, 8 years.

C. C. Howe, Rome, N. Y.; second prize, fifteen dollars; black gelding, 6 years.

Roadsters.

Erastus Corning, Albany, N. Y.; first prize, thirty dollars; Harriet Clay, black, 16, 5 years, bred by exhibitor; sire Corning's Harry Clay.

Alden Goldsmith, Washingtonville, N. Y.; second prize, fifteen dollars; Tracey, bay gelding, 16, foaled May 2, 1878; sire Volunteer, dam by American Star, gr. d. by Tremper's Bellfounder.

Saddle Horses.

Amasa J. Parker, Jr., Albany, N. Y.; first prize, thirty dollars; Pericles, bay gelding, 15.2, 6 years; sire Brown Ericsson, dam Lady Estes.

William T. Fondey, Albany, N. Y.; second prize, fifteen dollars; bay, 15.2, 9 years.

Ponies (under 13 hands), Broken to Harness or Saddle.

D. S. Hill, Sidney Plains, N. Y.; first prize, twenty dollars; Blanche, black and white, bred by Joseph Juliand, Bainbridge, N. Y.; sire Curly, dam Maggie.

Daniel G. Bradley, Albany, N. Y.; second prize, ten dollars; brown gelding, 5 years.

PAIRS OF MULES.

Houghton Farm, Mountainville, N. Y.; first prize, thirty dollars; gray, 15.3, 10 years.

SHEEP, SWINE AND POULTRY.

LONG WOOLED SHEEP,—LEICESTERS.

Rams, over Two Years Old.

W. S. Moore, Mt. Upton, N. Y.; first prize, twenty dollars.

Rams, One Year Old.

W. S. Moore, Mt. Upton, N. Y.; first prize, twenty dollars.

Ram Lambs.

W. S. Moore, Mt. Upton, N. Y.; second prize, five dollars.

Pens of Ewes, over Two Years Old.

W. S. Moore, Mt. Upton, N. Y.; first prize, twenty dollars.

Pens of Yearling Ewes.

W. S. Moore, Mt. Upton, N. Y.; first prize, ten dollars.

COTSWOLDS.

Rams, over Two Years Old.

George Chick, Attica, N. Y.; first prize, twenty dollars.

Rams, One Year Old.

George Chick, Attica, N. Y.; first prize, twenty dollars.

Ram Lambs.

George Chick, Attica, N. Y.; first prize, ten dollars.

Pens of Ewes, over Two Years Old.

George Chick, Attica, N. Y.; first prize, twenty dollars.

Pens of Yearling Ewes.

George Chick, Attica, N. Y.; first prize, twenty dollars.

Pens of Ewe Lambs.

George Chick, Attica, N. Y.; first prize, ten dollars.

LINCOLNS.

Rams, over Two Years Old.

Elmwood Farm, Geneva, N. Y.; first prize, twenty dollars.
Stryker & Jones, Rome, N. Y.; second prize, ten dollars.

Ram Lambs.

Elmwood Farm, Geneva, N. Y.; first prize, ten dollars.

Pens of Ewes, over Two Years Old.

Elmwood Farm, Geneva, N. Y.; first prize, twenty dollars.

Pens of Yearling Ewes.

Elmwood Farm, Geneva, N. Y.; first prize, twenty dollars.

Pens of Ewe Lambs.

Elmwood Farm, Geneva, N. Y.; first prize, ten dollars.

MIDDLE-WOOLED SHEEP,— SOUTHDOWNS.

Rams, over Two Years Old.

John Hobart Warren, Hoosick Falls, N. Y.; first prize, twenty dollars; Royal Reading, five years, bred by Lord Walsingham, England.

Smith Harding, South Deerfield, Mass.; second prize, ten dollars; Lord John, bred by Charles Chapman, England.

Rams, One Year Old.

John Hobart Warren, Hoosick Falls, N. Y.; first prize, twenty dollars; No. 10, bred by Lord Walsingham, England.

John Hobart Warren, Hoosick Falls, N. Y.; second prize, ten dollars; bred by exhibitor; sire Royal Reading.

Ram Lambs.

John Hobart Warren, Hoosick Falls, N. Y.; first prize, ten dollars; bred by exhibitor; sire Royal Reading.

John Hobart Warren, Hoosick Falls, N. Y.; second prize, five dollars; bred by exhibitor; sire Royal Reading.

Pens of Ewes, over Two Years Old.

John Hobart Warren, Hoosick Falls, N. Y.; first prize, twenty dollars; 3 years, bred by Lord Walsingham, England.

John Hobart Warren, Hoosick Falls, N. Y.; second prize, ten dollars; 3 years, bred by Lord Walsingham, England.

Pens of Yearling Ewes.

John Hobart Warren, Hoosick Falls, N. Y.; first prize, twenty dollars.

Pens of Ewe Lambs.

Smith Harding, South Deerfield, Mass.; first prize, ten dollars.

John Hobart Warren, Hoosick Falls, N. Y.; second prize, five dollars.

SHROPSHIRES.

Rams, over Two Years Old.

George Ingersoll, Fonda, N. Y.; first prize, twenty dollars; bred by Thomas Fenn, Shropshire, England.

C. D. Sickler, Malta, N. Y.; second prize, ten dollars; True Triplet, bred by William M. Miller, Claremont, Ont.

Rams, One Year Old.

George Ingersoll, Fonda, N. Y.; first prize, twenty dollars.

C. D. Sickler, Malta, N. Y.; second prize, ten dollars.

Ram Lambs.

George Ingersoll, Fonda, N. Y.; first prize, ten dollars.

C. D. Sickler, Malta, N. Y.; second prize, five dollars; General Wool.

Pens of Ewes, over Two Years Old.

George Ingersoll, Fonda, N. Y.; first prize, twenty dollars; bred by John Evans, Uffington, England.

C. D. Sickler, Malta, N. Y.; second prize, ten dollars; imported by William Major, Whiterale, Ont.; sire Lord Carlisle, 153.

Pens of Yearling Ewes.

C. D. Sickler, Malta, N. Y.; first prize, twenty dollars.

George Ingersoll, Fonda, N. Y.; second prize, ten dollars.

Pens of Ewe Lambs.

C. D. Sickler, Malta, N. Y.; first prize, ten dollars.

C. D. Sickler, Malta, N. Y.; second prize, five dollars.

HAMPSHIRES.

Rams over Two Years Old.

E. M. Benham, Hopewell Centre, N. Y.; first prize, twenty dollars.

Rams, One Year Old.

James Wood, Mt. Kisco, N. Y.; first prize, twenty dollars; bred by William Parsons, Micheldever, Hampshire, England.

E. M. Benham, Hopewell Centre, N. Y.; second prize, ten dollars.

Ram Lambs.

E. M. Benham, Hopewell Centre, N. Y.; first prize, ten dollars.

James Wood, Mt. Kisco, N. Y.; second prize, five dollars.

Pens of Ewes, over Two Years Old.

E. M. Benham, Hopewell Centre, N. Y.; first prize, twenty dollars.

James Wood, Mt. Kisco, N. Y.; second prize, ten dollars.

Pens of Yearling Ewes.

James Wood, Mt. Kisco, N. Y.; first prize, twenty dollars.
E. M. Benham, Hopewell Centre, N. Y.; second prize, ten dollars.

Pens of Ewe Lambs.

James Wood, Mt. Kisco, N. Y.; first prize, ten dollars.
E. M. Benham, Hopewell Centre, N. Y.; second prize, five dollars.

CHEVIOTS.

Rams, over Two Years Old.

William Curry, Hartwick, N. Y.; first prize, twenty dollars.
Ervin J. Bruce, Pittsfield, N. Y.; second prize, ten dollars.

Rams, One Year Old.

William Curry, Hartwick, N. Y.; first prize, twenty dollars.
Ervin J. Bruce, Pittsfield, N. Y.; second prize, ten dollars.

Ram Lambs.

Ervin J. Bruce, Pittsfield, N. Y.; first prize, ten dollars.
William Curry, Hartwick, N. Y.; second prize, five dollars.

Pens of Ewes, over Two Years Old.

Ervin J. Bruce, Pittsfield, N. Y.; first prize, twenty dollars.
William Curry, Hartwick, N. Y.; second prize, ten dollars.

Pens of Yearling Ewes.

William Curry, Hartwick, N. Y.; first prize, twenty dollars.
Ervin J. Bruce, Pittsfield, N. Y.; second prize, ten dollars.

Pens of Ewe Lambs.

William Curry, Hartwick, N. Y.; first prize, ten dollars.
Ervin J. Bruce, Pittsfield, N. Y.; second prize, five dollars.

FINE WOOLED SHEEP — MERINOS, BRED FOR FINENESS OF WOOL.

Rams, over Three Years Old.

C. D. & Charles Kenyon, Centre White Creek, N. Y.; first prize, twenty dollars.
George W. Ostrander, Hoosick Falls, N. Y.; second prize, ten dollars.

Rams, Two Years Old.

C. D. & Charles Kenyon, Centre White Creek, N. Y.; second prize, ten dollars.

Rams, One Year Old.

Davis Cossitt, Onondaga, N. Y.; first prize, twenty dollars.

Ram Lambs.

Davis Cossitt, Onondaga, N. Y.; first prize, ten dollars.
C. S. Galusha, Williamstown, Mass.; second prize, five dollars.

Pens of Ewes, over Three Years Old.

C. D. & Charles Kenyon, Centre White Creek, N. Y.; first prize, twenty dollars.

Pens of Ewes, Two Years Old.

C. D. & Charles Kenyon, Centre White Creek, N. Y.; first prize, twenty dollars.

Pens of Yearling Ewes.

C. D. & Charles Kenyon, Centre White Creek, N. Y.; first prize, twenty dollars.
C. S. Galusha, Williamstown, Mass.; second prize, ten dollars.

Pens of Ewe Lambs.

C. D. & Charles Kenyon, Centre White Creek, N. Y.; first prize, ten dollars.

MERINOS, BRED FOR WEIGHT OF FLEECE.

Rams, over Three Years Old.

S. B. James, Hoosick, N. Y.; first prize, twenty dollars.

Rams, Two Years Old.

John P. Ray, Hemlock Lake, N. Y.; first prize, twenty dollars.
William C. Eydesheimer, Tomhannock, N. Y.; second prize, ten dollars.

Rams, One Year Old.

John P. Ray, Hemlock Lake, N. Y.; first prize, twenty dollars.
John P. Ray, Hemlock Lake, N. Y.; second prize, ten dollars.

Ram Lambs.

John P. Ray, Hemlock Lake, N. Y.; first prize, twenty dollars.
Davis Cossitt, Onondaga, N. Y.; second prize, ten dollars.

Pens of Ewes, over Three Years Old.

Davis Cossitt, Onondaga, N. Y.; first prize, twenty dollars.

Pens of Ewes, Two Years Old.

Davis Cossitt, Onondaga, N. Y.; first prize, twenty dollars.
John P. Ray, Hemlock Lake, N. Y.; second prize, ten dollars.

Pens of Yearling Ewes.

John P. Ray, Hemlock Lake, N. Y.; first prize, twenty dollars.
Davis Cossitt, Onondaga, N. Y.; second prize, ten dollars.

Pens of Ewe Lambs.

John P. Ray, Hemlock Lake, N. Y.; first prize, twenty dollars.
S. B. James, Hoosick, N. Y.; second prize, ten dollars.

MERINOS, BRED FOR LENGTH OF STAPLE.

Rams, over Three Years Old.

Charles Kenyon, Centre White Creek, N. Y.; first prize, twenty dollars.
W. S. Moore, Mt. Upton, N. Y.; second prize, ten dollars.

Rams, Two Years Old.

J. O. Joslin, Tiashoke, N. Y.; first prize, twenty dollars.
W. S. Moore, Mt. Upton, N. Y.; second prize, ten dollars.

Rams, One Year Old.

Charles Kenyon, Centre White Creek, N. Y.; first prize, twenty dollars.
S. B. James, Hoosick, N. Y.; second prize, twenty dollars.

Ram Lambs.

Davis Cossitt, Onondaga, N. Y.; first prize, ten dollars.
W. S. Moore, Mt. Upton, N. Y.; second prize, five dollars.

Pens of Ewes, over Three Years Old.

J. O. Joslin, Tiashoke, N. Y.; first prize, twenty dollars.

Pens of Ewes, Two Years Old.

Davis Cossitt, Onondaga, N. Y.; first prize, twenty dollars.
Charles Kenyon, Centre White Creek, N. Y.; second prize, ten dollars.

Pens of Yearling Ewes.

John P. Ray, Hemlock Lake, N. Y.; first prize, twenty dollars.
Davis Cossitt, Onondaga, N. Y.; second prize, ten dollars.

Pens of Ewe Lambs.

S. B. James, Hoosick, N. Y.; first prize, ten dollars.
W. S. Moore, Mt. Upton, N. Y.; second prize, five dollars.

SWINE.

LARGE WHITE BREEDS.

Herds.

Aaron Webber, Nassau, N. Y.; gold medal.

Boars, over One Year Old.

Aaron Webber, Nassau, N. Y.; first prize, twenty dollars; Jumbo, bred by L. B. Silver, Cleveland, Ohio, farrowed September 14, 1883; sire Governor Allen, dam Lady Hancock by S. P. Chase, gr. d. Mrs. Grant.
Harris G. Haviland, Glens Falls, N. Y.; second prize, ten dollars; Eli.

Boars, under One Year Old.

H. G. Breese, Hoosick, N. Y.; second prize, ten dollars.

Sows, over One Year Old.

John L. Harmon, Chatham, N. Y.; first prize, twenty dollars.

Aaron Webber, Nassau, N. Y.; second prize, ten dollars; Princess, bred by L. B. Silver, Cleveland, Ohio; sire Old Murphy, dam Lady Prohibition by Grand Worthy Patriarch, gr. d. Teetotaler.

Sows, under One Year Old.

Aaron Webber, Nassau, N. Y.; first prize, twenty dollars.

CHESHIRES.

Herds.

Button Brothers, Chittenango, N. Y.; gold medal.

Boars, over One Year Old.

Button Brothers, Chittenango, N. Y.; first prize, twenty dollars; Royal Duke.

Coe Brothers, Kirkville, N. Y.; second prize, ten dollars; Our Choice.

Boars, under One Year Old.

E. W. Davis, Oneida, N. Y.; first prize, twenty dollars; Mercury H.

E. W. Davis, Oneida, N. Y.; second prize, ten dollars; Thor II.

Sows, over One Year Old.

Button Brothers, Chittenango, N. Y.; first prize, twenty dollars; Bess.

E. W. Davis, Oneida, N. Y.; second prize, ten dollars; Daisy II.

Sows, under One Year Old.

E. W. Davis, Oneida, N. Y.; first prize, twenty dollars; Phryne.

Button Brothers, Chittenango, N. Y.; second prize, ten dollars; Cathlina.

POLAND CHINAS.

Herds.

George H. Bell, Rome, N. Y.; gold medal.

Boars, over One Year Old.

George H. Bell, Rome, N. Y.; first prize, twenty dollars; General B.

James Seeley, Geneva, N. Y.; second prize, ten dollars; Black Prince.

Boars, under One Year Old.

George H. Bell, Rome, N. Y.; first prize, twenty dollars; Oxford King.

James Seeley, Geneva, N. Y.; second prize, ten dollars; Pride of Geneva.

Sows, over One Year Old.

James Seeley, Geneva, N. Y.; first prize, twenty dollars; Beauty.
George H. Bell, Rome, N. Y.; second prize, ten dollars; Flora B.

Sows, under One Year Old.

George H. Bell, Rome, N. Y.; first prize, twenty dollars; Beauty of Rome.
James Seeley, Geneva, N. Y.; second prize, ten dollars; Diamond.

DUROC — JERSEY.

Herds.

Harris G. Haviland, Glens Falls, N. Y.; gold medal.

Boars, over One Year Old.

Harris G. Haviland, Glens Falls, N. Y.; first prize, twenty dollars; Peerless Boy.
W. A. Alexander, Scipioville, N. Y.; second prize, ten dollars; Cayuga Chief.

Boars, under One Year Old.

James G. Mott, Lansingburgh, N. Y.; first prize, twenty dollars.
Harris G. Haviland, Glens Falls, N. Y.; second prize, ten dollars; Quaker Boy II.

Sows, over One Year Old.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, twenty dollars.
Harris G. Haviland, Glens Falls, N. Y.; second prize, ten dollars.

Sows, under One Year Old.

W. A. Alexander, Scipioville, N. Y.; first prize, twenty dollars; Cayuga Belle II.
James G. Mott, Lansingburgh, N. Y.; second prize, ten dollars.

SMALL WHITE BREEDS.

Herds.

T. R. Proctor, Utica, N. Y.; gold medal.

Boars, over One Year Old.

T. R. Proctor, Utica, N. Y.; first prize, twenty dollars; Lord Rinaldo.
T. R. Proctor, Utica, N. Y.; second prize, ten dollars; Duke of New York.

Boars, under One Year Old.

T. R. Proctor, Utica, N. Y.; first prize, twenty dollars; Proctor's Rinaldo III.
Ensign & Brown, Jeddo, N. Y.; second prize, ten dollars.

Sows, over One Year Old.

Ensign & Brown, Jeddo, N. Y.; first prize, twenty dollars.
T. R. Proctor, Utica, N. Y.; second prize, ten dollars; Sabrina.

Sows, under One Year Old.

A. G. Chriswell, Adams Basin, N. Y.; first prize, twenty dollars.
T. R. Proctor, Utica, N. Y.; second prize, ten dollars; Queen V.

BERKSHIRES.

Herds.

T. R. Proctor, Utica, N. Y.; gold medal.

Boars, over One Year Old.

T. R. Proctor, Utica, N. Y.; first prize, twenty dollars; Emperor 3d.
Waldo & Dudgeon, West Troy, N. Y.; second prize, ten dollars.

Boars, under One Year Old.

T. R. Proctor, Utica, N. Y.; first prize, twenty dollars; Pearl's Duke.
T. R. Proctor, Utica, N. Y.; second prize, ten dollars; Duke of Oxford.

Sows, over One Year Old.

T. R. Proctor, Utica, N. Y.; first prize, twenty dollars; Lucille Weston.
T. R. Proctor, Utica, N. Y.; second prize, ten dollars; Dutchess of York.

Sows, under One Year Old.

T. R. Proctor, Utica, N. Y.; first prize, twenty dollars; Proctor's Pearline.
T. R. Proctor, Utica, N. Y.; second prize, ten dollars; Farmer's Pearl.

ESSEX.

Herds.

Houghton Farm, Mountainville, N. Y.; gold medal.

Boars, over One Year Old.

Houghton Farm, Mountainville, N. Y.; first prize, twenty dollars; Ebony.

Boars, under One Year Old.

H. H. Johnson, Rural Hill, N. Y.; first prize, twenty dollars.
Houghton Farm, Mountainville, N. Y.; second prize, ten dollars; Marion.

Sows, over One Year Old.

Houghton Farm, Mountainville, N. Y.; first prize, twenty dollars; Cleopatra.
H. H. Johnson, Rural Hill, N. Y.; second prize, ten dollars.

Sows, under One Year Old.

H. H. Johnson, Rural Hill, N. Y.; first prize, twenty dollars.
Houghton Farm, Mountainville, N. Y; second prize, ten dollars; Angola.

POULTRY.

ASIATICS.

Breeding Pens of each Variety.

H. A. Jones, Worcester, Mass.; first prize, five dollars; partridge cochins.

James R. Draper, Troy, N. Y.; second prize, three dollars; light brahmas.

Light Brahmas.

C. E. Rockenstyre, Albany, N. Y.; first prize, three dollars.

James R. Draper, Troy, N. Y.; second prize, two dollars.

James Seeley, Geneva, N. Y.; third prize, one dollar.

Dark Brahmas.

C. A. Ballou, Worcester, Mass.; first prize, three dollars.

Jay M. Seymour, Clark's Mills, N. Y.; second prize, two dollars.

Jay M. Seymour, Clark's Mills, N. Y.; third prize, one dollar.

Buff Cochins.

Jay M. Seymour, Clark's Mills, N. Y.; first prize, three dollars.

Partridge Cochins.

H. A. Jones, Worcester, Mass.; first prize, three dollars.

Coffin, Zimmer & Co., Glens Falls, N. Y.; second prize, two dollars.

Coffin, Zimmer & Co., Glens Falls, N. Y.; third prize, one dollar.

White Cochins.

C. L. G. Blessing, Slingerlands, N. Y.; second prize, two dollars.

O. Howland & Son, Auburn, N. Y.; third prize, one dollar.

Black Cochins.

Jay M. Seymour, Clark's Mills, N. Y.; first prize, three dollars.

Jay M. Seymour, Clark's Mills, N. Y.; third prize, one dollar.

Langshans.

E. P. Kirby, East Chatham, N. Y.; first prize, three dollars.

E. P. Kirby, East Chatham, N. Y.; second prize, two dollars.

George Delavan, New Lebanon, N. Y.; third prize, one dollar.

DORKINGS.

Breeding Pens of each Variety.

W. J. Kirby, East Chatham, N. Y.; first prize, five dollars; white dorkings.

H. A. Jones, Worcester, Mass.; second prize, three dollars; colored dorkings.

Colored Dorkings.

William H. Seeger, Colliers, N. Y.; first prize, three dollars.
H. A. Jones, Worcester, Mass.; third prize, one dollar.

Silver Gray Dorkings.

H. A. Jones, Worcester, Mass.; first prize, three dollars.
O. Howland & Son, Auburn, N. Y.; second prize, two dollars.
H. A. Jones, Worcester, Mass.; third prize, one dollar.

White Dorkings.

W. J. Kirby, East Chatham, N. Y.; first prize, three dollars.
H. A. Jones, Worcester, Mass.; second prize, two dollars.
H. A. Jones, Worcester, Mass.; third prize, one dollar.

AMERICAN.

Breeding Pens of each Variety.

Jones Wilcox, East Chatham, N. Y.; first prize, five dollars; Wyandottes.
James R. Draper, Troy, N. Y.; second prize, three dollars; Plymouth Rocks.

American Dominiques.

Stephen Schuyler, West Troy, N. Y.; first prize, three dollars.
O. Howland & Son, Auburn, N. Y.; third prize, one dollar.

Plymouth Rocks.

James Seeley, Geneva, N. Y.; first prize, three dollars.
James R. Draper, Troy, N. Y.; second prize, two dollars.
Jones Wilcox, East Chatham, N. Y.; third prize, one dollar.

Wyandottes.

Jones Wilcox, East Chatham, N. Y.; first prize, three dollars.
George Delavan, New Lebanon, N. Y.; second prize, two dollars.
Jones Wilcox, East Chatham, N. Y.; third prize, one dollar.

Black Javas.

Lount Lattin, Staatsburgh, N. Y.; first prize, three dollars.
N. T. Lattin, Gaines, N. Y.; second prize, two dollars.
James Seeley, Geneva, N. Y.; third prize, one dollar.

Mottled Javas.

N. T. Lattin, Gaines, N. Y.; second prize, two dollars.

HAMBURGHS.

Breeding Pens of each Variety.

Charles L. Seeley, Afton, N. Y.; first prize, five dollars; black.
Jones Wilcox, East Chatham, N. Y.; second prize, three dollars; silver spangled.

Golden Spangled Hamburghs.

O. Howland & Son, Auburn, N. Y.; first prize, three dollars.

Silver Spangled Hamburghs.

Jones Wilcox, East Chatham, N. Y.; first prize, three dollars.
Jones Wilcox, East Chatham, N. Y.; second prize, two dollars.
S. O. Miner, Brattleboro, Vt.; third prize, one dollar.

Golden Penciled Hamburghs.

O. Howland & Son, Auburn, N. Y.; first prize, three dollars.

Silver Penciled Hamburghs.

H. A. Jones, Worcester, Mass.; second prize, two dollars.
O. Howland & Son, Auburn, N. Y.; third prize, one dollar.

Black Hamburghs.

Charles L. Seeley, Afton, N. Y.; first prize, three dollars.
Charles L. Seeley, Afton, N. Y.; second prize, two dollars.
O. Howland & Son, Auburn, N. Y.; third prize, one dollar.

SPANISH.

Breeding Pens of each Variety.

Jones Wilcox, East Chatham, N. Y.; first prize, five dollars; white leghorns.
Jones Wilcox, East Chatham, N. Y.; second prize, three dollars; brown leghorns.

Black Spanish.

O. Howland & Son, Auburn, N. Y.; first prize, three dollars.
F. G. Bradley, Albany, N. Y.; second prize, two dollars.
O. Howland & Son, Auburn, N. Y.; third prize, one dollar.

White Leghorns.

Douglas L. White, Albany, N. Y.; first prize, three dollars.
Wesley B. Barton, Pittsfield, Mass.; second prize, two dollars.
Jones Wilcox, East Chatham, N. Y.; third prize, one dollar.

Brown Leghorns.

Wesley B. Barton, Pittsfield, Mass.; first prize, three dollars.
Jones Wilcox, East Chatham, N. Y.; second prize, two dollars.
Douglas L. White, Albany, N. Y.; third prize, one dollar.

Black Leghorns.

Wesley B. Barton, Pittsfield, Mass.; first prize, three dollars.

FRENCH.

Breeding Pens of each Variety.

O. Howland & Son, Auburn, N. Y.; first prize, five dollars; Houdans.
John W. McHarg, Albany, N. Y.; second prize, three dollars; Houdans.

Crevecœurs.

Jay M. Seymour, Clark's Mills, N. Y.; first prize, three dollars.

Houdans.

Button Brothers, Chittenango, N. Y.; first prize, three dollars.
C. E. Rockenstyre, Albany, N.Y.; second prize, two dollars.
O. Howland & Son, Auburn, N. Y.; third prize, one dollar.

POLISH.

Breeding Pens of each Variety.

Charles H. Francisco, Mechanicville, N. Y.; first prize, five dollars; white crested black.
Charles L. Seeley, Afton, N. Y.; second prize, three dollars; white crested white.

White Crested Black Polish.

Charles L. Seeley, Afton, N. Y.; first prize, three dollars.
Charles L. Seeley, Afton, N. Y.; second prize, two dollars.
Charles L. Seeley, Afton, N. Y.; third prize, one dollar.

White Polish.

Charles L. Seeley, Afton, N. Y.; first prize, three dollars.
William H. Seeger, Colliers, N. Y.; second prize, two dollars.
Charles L. Seeley, Afton, N. Y.; third prize, one dollar.

Golden Polish.

S. C. Humphrey, Pittstown, N. Y.; third prize, one dollar.

Silver Polish.

James Seeley, Geneva, N. Y.; first prize, three dollars.
O. Howland & Son, Auburn, N. Y.; second prize, two dollars.
William H. Seeger, Colliers, N. Y.; third prize, one dollar.

Silkies.

H. G. Breese, Hoosick, N. Y.; third prize, one dollar.

GAMES.

Black-breasted Red Games.

O. Howland & Son, Auburn, N. Y.; first prize, three dollars.
O. Howland & Son, Auburn, N. Y.; second prize, two dollars.
Fred. Barney, Milford, N. Y.; third prize, one dollar.

Brown-breasted Red Games.

Fred. Barney, Milford, N. Y.; second prize, two dollars.

Red Pile Games.

Fred. Barney, Milford, N. Y.; first prize, three dollars.
Fred. Barney, Milford, N. Y.; second prize, two dollars.

Black Games.

Fred. Barney, Milford, N. Y.; first prize, three dollars.
Fred. Barney, Milford, N. Y.; second prize, two dollars.

GAME BANTAMS.

Breeding Pens of each Variety.

H. A. Jones, Worcester, Mass.; first prize, five dollars; black-breasted red.
H. A. Jones, Worcester, Mass.; second prize, three dollars; red pile.

Black-breasted Red Game Bantams.

H. A. Jones, Worcester, Mass.; first prize, three dollars.
E. B. Shaver, Nassau, N. Y.; second prize, two dollars.
C. A. Ballou, Worcester, Mass.; third prize, one dollar.

Brown-breasted Red Game Bantams.

H. A. Jones, Worcester, Mass.; first prize, three dollars.
H. A. Jones, Worcester, Mass.; second prize, two dollars.

Red Pile Game Bantams.

H. A. Jones, Worcester, Mass.; first prize, three dollars.
Coffin, Zimmer & Co., Glens Falls, N. Y.; second prize, two dollars.
H. A. Jones, Worcester, Mass.; third prize, one dollar.

Silver Duckwing Game Bantams.

O. Howland & Son, Auburn, N. Y.; first prize, three dollars.
C. L. G. Blessing, Slingerlands, N. Y.; second prize, two dollars,
C. L. G. Blessing, Slingerlands, N. Y.; third prize, one dollar.

Yellow Duckwing Game Bantams.

H. A. Jones, Worcester, Mass.; first prize, three dollars.
C. L. G. Blessing, Slingerlands, N. Y.; second prize, two dollars.

Black Game Bantams.

H. A. Jones, Worcester, Mass.; first prize, three dollars.
H. A. Jones, Worcester, Mass.; third prize, one dollar.

BANTAMS, OTHER THAN GAME.

Breeding Pens of each Variety.

Coffin, Zimmer & Co., Glens Falls, N. Y.; first prize, five dollars.
W. J. Kirby, East Chatham, N. Y.; second prize, three dollars.

Silver Sebrights.

Coffin, Zimmer & Co., Glens Falls, N. Y.; first prize, three dollars.
Coffin, Zimmer & Co., Glens Falls, N. Y.; second prize, two dollars.

Rose-combed Black.

H. A. Jones, Worcester, Mass.; first prize, three dollars.
H. A. Jones, Worcester, Mass.; second prize, two dollars.
C. L. G. Blessing, Slingerlands, N. Y.; third prize, one dollar.

White-crested White Polish.

W. J. Kirby, East Chatham, N. Y.; first prize, three dollars.
Coffin, Zimmer & Co., Glens Falls, N. Y.; second prize, two dollars.

TURKEYS.

Bronze.

James Seeley, Geneva, N. Y.; first prize, five dollars.
James Seeley, Geneva, N. Y.; second prize, three dollars.

GEESE.

Toulouse.

James Seeley, Geneva, N. Y.; first prize, five dollars.
James Seeley, Geneva, N. Y.; second prize, three dollars.
H. G. Breese, Hoosick, N. Y.; third prize, two dollars.

Embden.

A. G. Chriswell, Adams Basin, N. Y.; first prize, five dollars.
Coffin, Zimmer & Co., Glens Falls, N. Y.; second prize, three dollars.
Coffin, Zimmer & Co., Glens Falls, N. Y.; third prize, two dollars.

White Chinese.

William H. Seeger, Colliers, N. Y.; first prize, five dollars.
C. L. G. Blessing, Slingerlands, N. Y.; second prize, three dollars.
O. Howland & Son, Auburn, N. Y.; third prize, two dollars.

Brown Chinese.

C. L. G. Blessing, Slingerlands, N. Y.; first prize, five dollars.
C. L. G. Blessing, Slingerlands, N. Y.; second prize, three dollars.
F. G. Bradley, Albany, N. Y.; third prize, two dollars.

African.

William H. Seeger, Colliers, N. Y.; second prize, three dollars.

Wild.

Houghton Farm, Mountainville, N. Y.; first prize, five dollars.

O. Howland & Son, Auburn, N. Y.; second prize, three dollars.

DUCKS.

Rouen.

O. Howland & Son, Auburn, N. Y.; first prize, three dollars.
Jay M. Seymour, Clarks Mills, N. Y.; second prize, two dollars.
Button Brothers, Chittenango, N. Y.; third prize, one dollar.

Aylesbury.

W. J. Kirby, East Chatham, N. Y.; first prize, three dollars.
W. J. Kirby, East Chatham, N. Y.; second prize, two dollars.

Cayuga.

F. J. Bradley, Albany, N. Y.; first prize, three dollars.
O. Howland & Son, Auburn, N. Y.; third prize, one dollar.

White Muscovy.

C. L. G. Blessing, Slingerlands, N. Y.; second prize, two dollars.
C. L. G. Blessing, Slingerlands, N. Y.; third prize, one dollar.

Colored Muscovy.

H. A. Jones, Worcester, Mass.; second prize, two dollars.
C. L. G. Blessing, Slingerlands, N. Y.; third prize, one dollar.

Pekin.

James Seeley, Geneva, N. Y.; first prize, three dollars.
Jones Wilcox, East Chatham, N. Y.; second prize, two dollars.
Coffin, Zimmer & Co., Glens Falls, N. Y.; third prize, one dollar.

ORNAMENTAL FOWLS.

Pearl Guinea Fowls.

C. L. G. Blessing, Slingerlands, N. Y.; first prize, three dollars.
H. A. Jones, Worcester Mass.; second prize, two dollars.
H. A. Jones, Worcester, Mass.; third prize, one dollar.

White Guinea Fowls.

O. Howland & Son, Auburn, N. Y.; first prize, three dollars.
C. L. G. Blessing, Slingerlands, N. Y.; second prize, two dollars.
O. Howland & Son, Auburn, N. Y.; third prize, one dollar.

Pea Fowls.

Charles P. Green, West Sand Lake, N. Y.; second prize, two dollars.

PIGEONS.

Pouters.

Horace H. Henry, Lansingburgh, N. Y.; first prize, three dollars.
C. L. G. Blessing, Slingerlands, N. Y.; second prize, two dollars.
F. G. Bradley, Albany, N. Y.; third prize, one dollar.

Carriers.

John G. Mills, Albany, N. Y.; first prize, three dollars.
Horace H. Henry, Lansingburgh, N. Y.; second prize, two dollars.

Antwerps.

Horace H. Henry, Lansingburgh, N. Y.; first prize, three dollars.
C. L. G. Blessing, Slingerlands, N. Y.; second prize, two dollars.

Tumblers.

John G. Mills, Albany, N. Y.; first prize, three dollars.
John G. Mills, Albany, N. Y.; second prize, two dollars.
H. A. Jones, Worcester, Mass.; third prize, one dollar.

Barbs.

John G. Mills, Albany, N. Y.; first prize, three dollars.
John G. Mills, Albany, N. Y.; second prize, two dollars.
H. A. Jones, Worcester, Mass.; third prize, one dollar.

Turbits, Winged.

John G. Mills, Albany, N. Y.; first prize, three dollars.
H. A. Jones, Worcester, Mass.; second prize, two dollars.
H. A. Jones, Worcester Mass.; third prize, one dollar.

Owls, Solid Color.

John G. Mills, Albany, N. Y.; first prize, three dollars.
H. A. Jones, Worcester, Mass.; second prize, two dollars.
John G. Mills, Albany, N. Y.; third prize, one dollar.

Fantails.

John G. Mills, Albany, N. Y.; first prize, three dollars.
H. A. Jones, Worcester, Mass.; second prize, two dollars.
H. A. Jones, Worcester, Mass.; third prize, one dollar.

Jacobins.

C. L. G. Blessing, Slingerlands, N. Y.; first prize, three dollars.
Horace H. Henry, Lansingburgh, N. Y.; second prize, two dollars.

Ring Doves.

Horace H. Henry, Lansingburgh, N. Y.; first prize, three dollars.

Collections of Fantails.

H. A. Jones, Worcester, Mass.; first prize, three dollars.

RABBITS.

Angora.

James Seeley, Geneva, N. Y.; first prize, three dollars.

COLLIE DOGS.

Scotch Collie Dogs.

James R. Draper, Troy, N. Y.; first prize, five dollars.
James R. Draper, Troy, N. Y.; second prize, three dollars.

Scotch Collie Bitches.

James R. Draper, Troy, N. Y.; first prize, five dollars.
James R. Draper, Troy, N. Y.; second prize, three dollars.

Scotch Collie Bitches and Litters.

Houghton Farm, Mountainville, N. Y.; first prize, five dollars.
James R. Draper, Troy, N. Y.; second prize, three dollars.

HATCHING APPARATUS.

Incubators in Operation.

Perfect Hatcher Company, Elmira, N. Y.; first prize, ten dollars.
E. S. Renwick, New York, N. Y.; second prize, five dollars.

Artificial Mothers or Brooders.

Perfect Hatcher Company, Elmira, N. Y.; first prize, ten dollars.
Andrews Hatcher Company, Elmira, N. Y.; second prize, five dollars.

Models of Houses for Rearing Chickens.

Perfect Hatcher Company, Elmira, N. Y.; first prize, five dollars.

IMPLEMENTS, MACHINERY, AND MANUFACTURED ARTICLES.

NOTE.— The letters S. M. denote that a silver and B. M. that a bronze medal was awarded; C. H. M. that the exhibitor is entitled to a certificate of highest merit; C. M. to a certificate of merit.

Crown Manufacturing Co., Phelps, N. Y.; grass seeder. C. H. M.

E. A. Dewitt, Albany, N. Y.; Daniels plough sulkies and sulky plows. C. M.

Genesee Valley Manufacturing Co., Mt. Morris, N. Y.; Parsons self-adjusting land roller. C. H. M.

Reed Manufacturing Co., Canajoharie, N. Y.; corn planter attachment for grain drills. C. M.

J. S. Robinson, Canandaigua, N. Y.; improvement on plow coulter. C. H. M.

St. Lawrence Manufacturing Co., Gouverneur, N. Y.; disk harrow and seeder combined. C. H. M.

Wiard Plow Co., Batavia, N. Y.; sulky plow. C. M.

Bradley & Co., Syracuse, N. Y.; improvement on mower. C. H. M.

J. A. Cross, Fultonville, N. Y.; conveyor and elevator for hay, etc. B. M.

Crown Manufacturing Co., Phelps, N. Y.; hay unloader. C. H. M.

Eureka Mower Co., Utica, N. Y.; improvement on mower. C. M.

Elias F. Ford, Stillwater, N. Y.; potato digger. C. M.

E. V. R. Gardner & Co., West Town, N. Y.; Gardner's railway hay pitching apparatus. C. M.

George T. Lane, Troy, N. Y.; Harrington potato digger. C. H. M.

American Manufacturing Co., Waynesboro, Penn.; American Evaporator. C. H. M.

Boomer & Boschert Press Co., Syracuse, N. Y.; cider-making machinery. B. M.

Boomer & Boschert Press Co., Syracuse, N. Y.; cider pump, apple grater and elevator. C. H. M.

Boomer & Boschert Press Co., Syracuse, N. Y.; cider jelly evaporator. C. H. M.

W. W. Bryan, Reynolds, N. Y.; grain fan. C. M.

W. H. Ferguson, Albany, N. Y.; cider press and racks. C. M.

Gere, Truman, Platt & Co., Oswego, N. Y.; corn-sheller. C. H. M.

D. B. Hendricks, Glasco, N. Y.; hay-baling press. C. M.

Moravia Foundry and Machine Co., Moravia, N. Y.; Steele's improved portable feed and middlings mill. B. M.

Rensselaer Agricultural Works, Melrose, N. Y.; double blast fanning mills. C. H. M.

St. Albans Foundry, St. Albans, Vt.; fodder shredder. C. M.

D. W. Seeley, Albany, N. Y.; hay presses. S. M.

S. B. Van Derzee Manufacturing Co., Gouverneur, N. Y.; Bonanza grain and seed separator and Bonanza, jr., fanning mill. C. H. M.

Vermont Farm Machine Co., Bellows Falls, Vt.; pneumatic fruit dryer. C. M.

Vermont Farm Machine Co., Bellows Falls, Vt.; galvanized iron sugar evaporator. C. M.

Wheeler & Melick Co., Albany, N. Y.; straw-preserving thresher and cleaner. B. M.

Wheeler & Melick Co., Albany, N. Y.; Robinson's hay and cotton press. C. M.

Aldrich Wind-mill Co., Aldrich wind-mill. C. H. M.

Challenge Wind-mill and Feed-mill Co., Batavia, Ill.; wind-mill for pumping. C. M.

Challenge Wind-mill and Feed-mill, Co., Batavia, Ill.; double-header wind-mill for running machinery and pumping. B. M.

E. Doncaster, Mechanicville, N. Y.; novelty planing machine. C. H. M.

E. Doncaster, Mechanicville, N. Y.; sand-paper machine. C. H. M.

Moravia Foundry and Machine Co., Moravia, N. Y.; Steele's improved portable saw-mill. C. H. M.

Porter Manufacturing Co., Syracuse, N. Y.; Economizer portable engine and boiler. B. M.

St. Alban's Foundry, St. Albans, Vt.; speed regulator. C. M.

Sherwood & Brewster, Brewsters, N. Y.; champion bog-cutter. C. H. M.

Anson D. Simpson, Niverville, N. Y.; Simpson friction clutch. C. H. M.

G. T. Smith Middlings Purifier Co., Jackson, Mich.; centrifugal flour dressing machine. B. M.

The Pitts Agricultural Works, Buffalo, N. Y.; traction engine. B. M.

Treman, Waterman & Co., Ithaca, N. Y.; Brown's improved well drilling machine. C. M.

Union Wind-mill Manufacturing Co., Albion, Mich.; wind-mills. C. M.

Wheeler & Melick Co., Albany, N Y.; vertical steam engine. C. H. M.

Levi Wood, Albany, N. Y.; mechanical power, C. H. M.

John S. Carter, Syracuse, N. Y.; O. K. cabinet creamery. C. H. M.

Chapin & Smith, Poultney, Vt.; Surprise churn. C. M.

Oakes & Burger, Cattaraugus, N. Y.; Empire State milk can. C. M.

Vermont Farm Machine Co., Bellows Falls, Vt.; Cooley creamer, cabinet and elevator. C. M.

Vermont Farm Machine Co., Bellows Falls, Vt.; Davis swing churn. C. H. M.

Vermont Farm Machine Co., Bellows Falls, Vt.; Eureka, Shimer and improved Philadelphia butter workers. C. H. M.

Vermont Farm Machine Co., Bellows Falls, Vt.; Nesbitt butter printer. C. M.

Orrin A. Anthony, Mayfield, N. Y.; steel-plated sleigh shoes. C. M.

Brooks & Parsons, Addison, N. Y.; Smith self-adjusting swing cattle stanchion. C. H. M.

C. T. Bush, Maryland, N. Y.; iron fence. C. H. M.

Fairbanks & Co., Albany, N. Y.; standard scales. C. M.

Howard & Jennings, Syracuse, N. Y.; wooden suction and lift pumps. C. M.

Milo H. Ingalls, North Granville, N. Y.; adjustable wagon jack. C. M.

Jackson Brothers, Albany, N. Y.; drain pipe, drain tile and brick. C. H. M.

Jones of Binghamton, Binghamton, N. Y.; wagon scales. C. H. M.

J. I. Lansing & Co., Mechanicville, N. Y.; Ingraham's sickle grinder and grindstone. C. M.

National Iron Fence Co., New York City; all-iron fence. B. M.

Thomas Partlan, Rondout, N. Y.; Partlan's patent horse-shoer's hammer and horse shoes. B. M.

H. C. Pratt, Canandaigua, N. Y.; portable barbed wire fence. C. H. M.

Sherwood Harness Co., Syracuse, N. Y.; Sherwood's steel harness. B. M.

Crosby & Co., Albany, N. Y.; Crosby's patent sash holder and spring weather strip. C. M.

Thomas Curley, Troy, N. Y.; patent corkscrews. C. H. M.

Daisy Tot Manufacturing Co., Albany, N. Y.; sewing machines for children. B. M.

Domestic Sewing Machine Co., Albany, N. Y.; Domestic sewing machine. C. H. M.

W. I. Herrick, Schodack Landing, N. Y.; ash sifter. C. M.

David H. Mathias, Albany, N. Y.; washing machine. C. M.

John S. Tilley, West Troy, N. Y.; ladders, clothes-horses. C. H. M.

Tripp Brothers, East Williamson, N. Y.; hand apple-parer, corer and slicer. C. M.

D. H. Van Cott, Adams Station, N. Y.; lightning washing machine. C. H. M.

C. M. Velsey, ——; single and double electric light oil stoves. C. H. M.

White Sewing Machine Co.; Albany, N. Y.; sewing machines, automatic. C. H. M.

Fales & Co., Poultney, Vt.; Fales traverse sleighs for light and heavy work. C. H. M.

Fitch Gear Co., Rome, N. Y.; Fitch reach, platform spring, wagon gears. B. M.

Flint Wagon Works, Flint, Mich.; farm wagons. B. M.

Gere, Truman & Co., Oswego, N. Y.; farm wagons. C. M.

Kirkwood Wagon Co., Kirkwood, N. Y.; Booth's patent platform-spring business and pleasure wagons.

Lansing Wagon Works, Lansing, Mich.; lumber bob-sleighs. B. M.

Lansing Wagon Works, Lansing, Mich.; farm wagons. C. H. M.

Milburn Wagon Co., Toledo, O., business wagons. B. M.

Patent Lock Thill Coupling Co., South Westerlo, N. Y.; attachment for thills and pole without use of bolts. C. M.

Martin Payne, Troy, N. Y.; track sulkies. C. H. M.

Pell Gear Co., Rome, N. Y.; Pell's carriage side-bar gear. B. M.

Troy Carriage Works, Troy, N. Y.; light carriages, road carts, and sleighs. B. M.

Albany Cork Works, Albany, N. Y.; manufactured corks. C. H. M.

Fairbanks & Co., Albany, N. Y.; Shipman's automatic kerosene engines. B. M.

Charles Fasoldt, Albany, N. Y.; chronometers, microscopes, microscopic rulings and combined micrometer. C. H. M.

E. J. Larrabee & Co., Albany, N. Y.; plain and fancy biscuits. C. H. M.

Lewis Hand Fire Extinguisher Co., New York city, N. Y.; Lewis fire extinguisher. C. H. M.

Stuart G. Spier, Albany, N. Y.; Remington standard typewriter. C. H. M.

FARM PRODUCE.

GRAIN, SEEDS, AND HOPS GROWN IN 1885.

White Winter Wheat.

James Miller, Penn Yan, N. Y.; first prize, ten dollars.

John M. Hotaling, Adams Station, N. Y.; second prize, five dollars.

Red Winter Wheat.

Horace W. Hotaling, Adams Station, N. Y.; and Myron F. Pierson, Seneca Castle, N. Y.; seven and one-half dollars each, prizes divided.

Spring Wheat.

George Campbell, Green's Landing, Penn.; first prize, ten dollars.

Winter Rye.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, ten dollars.

James I. Arnold, Jerusalem, N. Y.; second prize, five dollars.

Spring Rye.

George Campbell, Green's Landing, Penn.; first prize, ten dollars.

E. Van Allen, Bethlehem Centre, N. Y.; second prize, five dollars.

White Oats.

George Campbell, Green's Landing, Penn.; first prize, ten dollars.

Charles Bender, New Scotland, N. Y.; second prize, five dollars.

Black or Gray Oats.

George Campbell, Green's Landing, Penn.; first prize, ten dollars.

C. L. G. Blessing, Slingerlands, N. Y.; second prize, five dollars.

Two-rowed Spring Barley.

George Campbell, Green's Landing, Penn.; first prize, ten dollars.

Four-rowed Spring Barley.

George Campbell, Green's Landing, Penn.; first prize, ten dollars.

Yellow Indian Corn (shelled).

E. Van Allen, Bethlehem Centre, N. Y.; first prize, ten dollars.
Alexander Smith, Nassau, N. Y.; second prize, five dollars.

Large Field Beans.

C. L. G. Blessing, Slingerlands, N. Y.; first prize, ten dollars.

Large Field Peas.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, ten dollars.
L. L. French, Richfield Springs, N. Y.; second prize, five dollars.

Small Field Peas.

L. L. French, Richfield Springs, N. Y.; first prize, ten dollars.
E. Van Allen, Bethlehem Centre, N. Y.; second prize, five dollars.

Buckwheat.

George Campbell, Green's Landing, Penn.; first prize, five dollars.
E. Van Allen, Bethlehem Centre, N. Y.; second prize, three dollars.

Timothy Seed.

John M. Hotaling, Adams Station, N. Y., and E. Van Allen, Bethlehem Centre, N. Y.; four dollars each; prizes divided.

Millet.

E. Van Allen, Bethlehem Centre, N. Y.; second prize, three dollars.

Flax Seed.

George Campbell, Green's Landing, Penn.; first prize, five dollars.
E. Van Allen, Bethlehem Centre, N. Y.; second prize, three dollars.

Sorghum Seed.

E. Van Allen, Bethlehem Centre, N. Y.; second prize, three dollars.

Seed Ears of Yellow Corn, Eight-rowed.

Alexander Smith, Nassau, N. Y.; first prize, five dollars.
Charles Turner, Bethlehem Centre, N. Y.; second prize, three dollars.

Seed Ears of Yellow Corn, Twelve-rowed.

Charles Turner, Bethlehem Centre, N. Y.; first prize, five dollars.
Jones Wilcox, East Chatham, N. Y.; second prize, three dollars.

Seed Ears White Corn.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, five dollars.
P. C. Van Allen, Slingerlands, N. Y.; second prize, three dollars.

Seed Ears Dent Corn.

Charles Coolidge, Phelps, N. Y.; first prize, five dollars.

Seed Ears Early Sweet Corn.

W. E. Hayward, Rochester, N. Y.; first prize, five dollars.
E. Van Allen, Bethlehem Centre, N. Y.; second prize, three dollars.

Seed Ears Late Sweet Corn.

Charles Coolidge, Phelps, N. Y.; first prize, five dollars.
Stryker & Jones, Rome, N. Y.; second prize, three dollars.

Hops.

William H. Seeger, Colliers, N. Y.; first prize, ten dollars.

VEGETABLES.

Celery.

Howard Brothers, Rochester, N. Y.; first prize, three dollars.
D. W. Seeley, Albany, N. Y.; second prize, two dollars.

Cauliflowers.

Howard Brothers, Rochester, N. Y.; first prize, three dollars.

Cabbages.

Howard Brothers, Rochester, N. Y.; first prize, three dollars.
E. Van Allen, Bethlehem Centre, N. Y.; second prize, two dollars.

Lettuce.

Howard Brothers, Rochester, N. Y.; first prize, three dollars.
Myron F. Pierson, Seneca Castle, N. Y.; second prize, two dollars.

Turnips.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, three dollars.
Howard Brothers, Rochester, N. Y.; second prize, two dollars.

Mangolds.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, three dollars.
L. H. Myers, Bethlehem Centre, N. Y.; second prize, two dollars.

Beets.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, three dollars.
Howard Brothers, Rochester, N. Y.; second prize, two dollars.

Orange Carrots.

Howard Brothers, Rochester, N. Y.; first prize, three dollars.
Francis Bradt, Jerusalem, N. Y.; second prize, two dollars.

White Carrots.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, three dollars.
Howard Brothers, Rochester, N. Y.; second prize, two dollars.

Parsnips.

L. H. Myers, Bethlehem Centre, N. Y.; first prize, three dollars.
Howard Brothers, Rochester, N. Y.; second prize, two dollars.

Salsify.

Howard Brothers, Rochester, N. Y.; first prize, three dollars.

Kohl-Rabi.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, three dollars.
Oscar J. Lewis, Schodack Centre, N. Y.; second prize, two dollars.

Onions.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, three dollars.
L. H. Myers, Bethlehem Centre, N. Y.; second prize, two dollars.

Tomatoes.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, three dollars.
L. H. Myers, Bethlehem Centre, N. Y.; second prize, two dollars.

Egg Plants.

C. V. Baker, Cedar Hill, N. Y.; first prize, three dollars.
L. H. Myers, Bethlehem Centre, N. Y.; second prize, two dollars.

Garden Beans.

Myron F. Pierson, Seneca Castle, N. Y.; first prize, three dollars.
W. E. Hayward, Rochester, N. Y.; second prize, two dollars.

Peppers.

W. E. Hayward, Rochester, N. Y.; first prize, three dollars.
E. Van Allen, Bethlehem Centre, N. Y.; second prize, two dollars.

Squashes.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, three dollars.
L. H. Myers, Bethlehem Centre, N. Y.; second prize, two dollars.

Pumpkins.

Myron F. Pierson, Seneca Castle, N. Y.; first prize, three dollars.
John S. Harmon, Chatham, N. Y.; second prize, two dollars.

Sweet Potatoes.

Oscar J. Lewis, Schodack Centre, N. Y.; first prize, three dollars.

Potatoes — Exhibitions of Early Varieties.

Myron F. Pierson, Seneca Castle, N. Y.; first prize, ten dollars.
Edward H. Strang, Ketchum's Corners, N. Y.; second prize, five dollars.

Potatoes — Exhibitions of Late Varieties.

Myron F. Pierson, Seneca Castle, N. Y.; first prize, ten dollars.
Edward H. Strang, Ketchum's Corners, N. Y.; second prize, five dollars.

Potatoes — Exhibitions of Stock-feeding Varieties.

Myron F. Pierson, Seneca Castle, N. Y.; first prize, ten dollars.
E. Van Allen, Bethlehem Centre, N. Y.; second prize, five dollars.

Collections of Vegetables.

Howard Brothers, Rochester, N. Y.; first prize, twenty-five dollars.

BUTTER.

Special Prize for the Best Six Packages, not less than thirty lbs. net, each, made in the same Creamery or Private Dairy.

Merritt Creamery, Lisbon, N. Y.; fifty dollars.

Packages made in June in Creamery.

M. D. Chapin, Poultney, Vt.; first prize, thirty dollars.
Risley Brothers, New York Mills, N. Y.; second prize, twenty dollars.

Packages made at any time in Creamery.

Merritt Creamery, Lisbon, N. Y.; first prize, thirty dollars.
Risley Brothers, New York Mills, N. Y.; second prize, twenty dollars.

Packages made in June in Private Dairy.

William F. Ford, West Davenport, N. Y.; first prize, thirty dollars.
John S. Harmon, Chatham, N. Y.; second prize, twenty dollars.
Henry Schoonmaker, Cedar Hill, N. Y.; third prize, ten dollars.

Packages made at any time in Private Dairy.

A. C. Biggar, Pepacton, N. Y.; first prize, thirty dollars.
E. Van Allen, Bethlehem Centre, N. Y.; second prize, twenty dollars.
John S. Harmon, Chatham, N. Y.; third prize, ten dollars.

Molds or Rolls.

A. B. Cary, West Winfield, N. Y.; first prize, fifteen dollars.
M. A. Winne, Bethlehem Centre, N. Y.; second prize, ten dollars.
M. D. Chapin, Poultney, Vt.; third prize, five dollars.

CHEESE.

Special Prize for the Best Dozen Cheeses, not less than twenty lbs. each, from the same Factory or Dairy, and suitable for army or other use.

Seth Bonfoy, West Winfield, N. Y.; and George R. Wright, Whitestown, N. Y.; prize divided, twenty-five dollars each.

American Cheese over One Year Old.

Samuel Hilton, Flat Creek, N. Y.; first prize, thirty dollars.
George R. Wright, Whitestown, N. Y.; second prize, twenty dollars.
Mrs. J. A. Henry, Reed's Corners, N. Y.; third prize, ten dollars.

American Cheese less than One Year Old.

Samuel Hilton, Flat Creek, N. Y.; first prize, thirty dollars.
H. L. Davis, Princetown, N. Y.; second prize, twenty dollars.
George R. Wright, Whitestown, N. Y.; third prize, ten dollars.

BREAD, SUGAR, ETC.

Wheaten Bread.

Miss L. P. Tennant, Stanwix, N. Y.; first prize, five dollars.
Jones Wilcox, East Chatham, N. Y.; second prize, three dollars.

Rye Bread.

Miss Cora Henry, Reed's Corners, N. Y.; first prize, five dollars.
Mrs. J. A. Henry, Reed's Corners, N. Y.; second prize, three dollars.

Indian, or Rye and Indian, Bread.

John M. Hotaling, Adams Station, N. Y.; first prize, five dollars.
Jones Wilcox, East Chatham, N. Y.; second prize, three dollars.

Maple Sugar.

William F. Ford, West Davenport, N. Y.; first prize, five dollars.

Maple Syrup.

William F. Ford, West Davenport, N. Y.; second prize, three dollars.

Preserved Fresh Fruits.

Nettie E. Howland, Auburn, N, Y.; first prize, five dollars.
Mrs. E. F. Lampman, Albany, N. Y.; second prize, three dollars.

Canned Fruits.

Mrs. E. F. Lampman, Albany, N. Y.; first prize, five dollars.
E. Van Allen, Bethlehem Centre, N. Y.; second prize, three dollars.

Pickles in Vinegar.

F. & J. Heinz, Pittsburg, Penn.; first prize, five dollars.
Nettie E. Howland, Auburn, N. Y.; second prize, three dollars.

Dried Apples.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, five dollars.
Oscar J. Lewis, Schodack Centre, N. Y.; second prize, three dollars.

Dried Peaches.

Miss L. P. Tennant, Stanwix, N. Y.; first prize, five dollars.
Mrs. W. H. Graves, Blossvale, N. Y.; second prize, three dollars.

Dried Whortleberries.

Miss L. P. Tennant, Stanwix, N. Y.; first prize, five dollars.
Mrs. S. M. Williams, Taberg, N. Y.; second prize, three dollars.

Dried Raspberries.

Mrs. John Harmon, Red Rock, N. Y.; first prize, five dollars.
Mrs. J. A. Henry, Reed's Corners, N. Y.; second prize, three dollars.

BEES AND HONEY.

Italian Bees.

G. T. Smith, Jonesville, N. Y.; first prize, five dollars.

Black Bees.

G. T. Smith, Jonesville, N. Y.; first prize, five dollars.

Frame with Queen Cells.

G. T. Smith, Jonesville, N. Y.; first prize, five dollars.

Comb Honey made from White Clover or Linden.

P. Miller, Fredonia, N. Y.; first prize, five dollars.
G. T. Smith, Jonesville, N. Y.; second prize, three dollars.

Comb Honey made from Fall Flowers.

G. T. Smith, Jonesville, N. Y.; first prize, five dollars.

Extracted Honey made from White Clover or Linden.

G. T. Smith, Jonesville, N. Y.; first prize, five dollars.

Extracted Honey made from Fall Flowers.

G. T. Smith, Jonesville, N. Y.; first prize, five dollars.

DOMESTIC MANUFACTURES.

Woolen Blankets.

Mrs. W. H. Graves, Blossvale, N. Y.; first prize, five dollars.
Harriet Brownell, Knowersville, N. Y.; second prize, three dollars.

All-Wool Horse Blankets.

M. H. Tennant, Rome, N. Y.; first prize, five dollars.
Mrs. S. M. Williams, Taberg, N. Y.; second prize, three dollars.

Woolen Flannel.

Mrs. S. M. Williams, Taberg, N. Y.; first prize, five dollars.
Mrs. W. H. Graves, Blossvale, N. Y.; second prize, three dollars.

Flannel, Cotton Warp.

Mrs. S. M. Williams, Taberg, N. Y.; first prize, five dollars.
Miss L. P. Tennant, Stanwix, N. Y.; second prize, three dollars.

Linsey-Woolsey.

Mrs. S. M. Williams, Taberg, N. Y.; second prize, three dollars.

Cotton and Wool Kersey.

Harriet Brownell, Knowersville, N. Y.; first prize, five dollars.

Rag Carpet.

Harriet Brownell, Knowersville, N. Y.; first prize, five dollars.
Jones Wilcox, East Chatham, N. Y.; second prize, three dollars.

Hearth Rugs.

Mrs. J. A. Henry, Reed's Corners, N. Y.; first prize, five dollars.
David Aldridge, Rome, N. Y.; second prize, three dollars.

Double Carpet Coverlets.

Miss L. P. Tennant, Stanwix, N. Y,; first prize, five dollars.

Linen Cloth.

Caroline Brownell, Knowersville, N. Y.; second prize, three dollars.

Linen Diaper.

Caroline Brownell, Knowersville, N. Y.; first prize, five dollars.
Hester Ann Vanderzee, Bethlehem Centre, N. Y.; second prize, three dollars.

Linen Kersey.

Mrs. S. M. Williams, Taberg, N. Y.; first prize, five dollars.
Jones Wilcox, East Chatham, N. Y.; second prize, three dollars.

Linen Bagging.

Mrs. Isaac Van Allen, Bethlehem Center, N. Y.; first prize, five dollars.

Knit Bed Spreads.

Caroline Brownell, Knowersville, N. Y.; first prize, three dollars.
Miss Emma L. Dorr, Albany, N. Y.; second prize, two dollars.

Worked or Quilted Bed Spreads.

David Aldridge, Rome, N. Y.; first prize, three dollars.
Mrs. S. B. Douglas, Reed's Corners, N. Y.; second prize, two dollars.

Silk Quilts.

Miss Emma M. Bouke, Troy, N. Y.; first prize, three dollars.
Mrs. B. Snyder, Van Wie's, N. Y.; second prize, two dollars.

Balmoral Petticoats.

Mrs. S. M. Williams, Taberg, N. Y.; first prize, three dollars.

Woolen Knit Stockings.

Miss L. P. Tennant, Stanwix, N. Y.; first prize, three dollars.
Mrs. John Harmon, Red Rock, N. Y.; second prize, two dollars.

Worsted Knit Stockings.

M. H. Tennant, Rome, N. Y.; first prize, three dollars.
Miss L. P. Tennant, Stanwix, N. Y.; second prize, two dollars.

Woolen Knit Mittens.

Mrs. John Harmon, Red Rock, N. Y.; first prize, three dollars.
M. H. Tennant, Rome, N. Y.; second prize, two dollars.

Woolen Fringe Mittens.

Mrs. S. M. Williams, Taberg, N. Y.; first prize, three dollars.
M. H. Tennant, Rome, N. Y.; second prize, two dollars.

Woolen Socks, by Girl under Twelve.

Miss Mary Williams, Taberg, N. Y.; first prize, three dollars.

Woolen Yarn, by Girl under Twelve.

Miss Mary Williams, Taberg, N. Y.; first prize, three dollars.

Linen or Cotton Knit Stockings.

Miss L. P. Tennant, Stanwix, N. Y.; first prize, three dollars.
G. H. F. Van Horne, Fonda, N. Y.; second prize, two dollars.

Linen Sewing Thread.

Miss L. P. Tennant, Stanwix, N. Y.; first prize, three dollars.
Mrs. Isaac Van Allen, Bethlehem Centre, N. Y.; second prize, two dollars.

FLOWERS.

PROFESSIONAL LIST.

Exhibitions of Cut Flowers.

L. Menand & Sons, Albany, N. Y.; first prize, ten dollars.
James Vick, Rochester, N. Y.; second prize, five dollars.

Collections of Dahlias.

James Vick, Rochester, N. Y.; first prize, six dollars.

Twenty-four Dahlias.

James Vick, Rochester, N. Y; first prize, five dollars.

Twelve Dahlias.

James Vick, Rochester, N. Y.; first prize, three dollars.

American Seedling Dahlia.

James Vick, Rochester, N. Y.; first prize, two dollars.

Collections of Roses.

James Hendrick, Albany, N. Y.; first prize, six dollars.

Collections of Phloxes.

James Vick, Rochester, N. Y.; first prize, five dollars.

Twelve Phloxes.

James Vick, Rochester, N. Y.; first prize, three dollars.

Seedling Phlox.

James Vick, Rochester, N. Y.; first prize, one dollar.

Collections of Verbenas.

James Vick, Rochester, N. Y.; first prize, five dollars.

Twelve Verbenas.

James Vick, Rochester, N. Y.; first prize, three dollars.

American Seedling Verbena.

James Vick, Rochester, N. Y.; first prize; one dollar.

Collections of Asters.

James Vick, Rochester, N. Y.; first prize, three dollars.

Collections of Celosias.

James Vick, Rochester, N. Y.; first prize, three dollars.

Collections of Lilies.

James Vick, Rochester, N. Y.; first prize, three dollars.

Collections of Ten Week Stocks.

James Vick, Rochester, N. Y.; first prize, three dollars.

Collections of Gladiolus.

James Vick, Rochester, N. Y.; first prize, three dollars.

Twelve Gladiolus.

James Vick, Rochester, N. Y.; first prize, two dollars.

AMATEUR LIST.

Collections of Cut Flowers.

M. H. Tennant, Rome, N. Y.; first prize, ten dollars.
Miss L. P. Tennant, Stanwix, N. Y.; second prize, five dollars.

Collections of Dahlias.

M. H. Tennant, Rome, N. Y.; first prize, six dollars.
Mrs. John Harmon, Red Rock, N. Y.; second prize, three dollars.

Twelve Dahlias.

Miss L. P. Tennant, Stanwix, N. Y.; first prize, three dollars.
M. H. Tennant, Rome, N. Y.; second prize, two dollars.

Six Dahlias.

M. H. Tennant, Rome, N. Y.; first prize, two dollars.
Miss L. P. Tennant, Stanwix, N. Y.; second prize, one dollar.

Collections of Roses.

Miss L. P. Tennant, Stanwix, N. Y.; second prize, three dollars.

Collections of Verbenas.

M. H. Tennant, Rome, N. Y.; first prize, five dollars.
Miss L. P. Tennant, Stanwix, N. Y.; second prize, three dollars.

Twelve Verbenas.

M. H. Tennant, Rome, N. Y.; first prize, three dollars.
Miss L. P. Tennant, Stanwix, N. Y.; second prize, two dollars.

Six Verbenas.

Miss L. P. Tennant, Stanwix, N. Y.; first prize, two dollars.
M. H. Tennant, Rome, N. Y.; second prize, one dollar.

Collections of Phloxes.

M. H. Tennant, Rome, N. Y.; first prize, five dollars.
Miss L. P. Tennant, Stanwix, N. Y.; second prize, three dollars.

Six Phloxes.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, two dollars.

Collections of Asters.

M. H. Tennant, Rome, N. Y.; first prize, three dollars.
Miss L. P. Tennant, Stanwix, N. Y.; second prize, two dollars.

Collections of Pansies.

M. H. Tennant, Rome, N. Y.; first prize, three dollars.
Miss L. P. Tennant, Stanwix, N. Y.; second prize, two dollars.

Collections of Stocks.

M. H. Tennant, Rome, N. Y.; first prize, three dollars.
Miss L. P. Tennant, Stanwix, N. Y.; second prize, two dollars.

Collections of Gladiolus.

M. H. Tennant, Rome, N. Y.; first prize, three dollars.
Miss L. P. Tennant, Stanwix, N. Y.; second prize, two dollars.

Twelve Gladiolus.

Miss L. P. Tennant, Stanwix, N. Y.; first prize, two dollars.
M. H. Tennant, Rome, N. Y.; second prize, one dollar.

Collections of Everlasting Flowers.

M. H. Tennant, Rome, N. Y.; first prize, three dollars.

PLANTS IN POTS, ETC.

Collections of Pot Plants.

L. Menand & Sons, Albany, N. Y.; first prize, fifteen dollars.

Twenty Varieties of Pot Plants.

L. Menand & Sons, Albany, N. Y.; first prize, ten dollars.

Ten Varieties of Pot Plants.

L. Menand & Sons, Albany, N. Y.; first prize, five dollars.

Groups of Palms.

L. Menand & Sons, Albany, N. Y.; first prize, eight dollars.

Groups of Ferns.

L. Menand & Sons, Albany, N. Y.; first prize, five dollars.

Six Variegated Leaved Plants.

L. Menand & Sons, Albany, N. Y.; first prize, five dollars.

Single Variegated Leaved Plants.

L. Menand & Sons, Albany, N. Y.; first prize, two dollars.

Single Variety of Fuchsia.

L. Menand & Sons, Albany, N. Y.; first prize, two dollars.

Twelve Succulents.

L. Menand & Sons, Albany, N. Y.; first prize, five dollars.

Pairs of Hand Bouquets.

H. Marshall, Mechanicville, N. Y.; second prize, three dollars.

Pairs of Table Bouquets.

L. Menand & Sons, Albany, N. Y.; first prize, five dollars.

Six Button-hole Bouquets.

L. Menand & Sons, Albany, N. Y.; first prize, three dollars.

Baskets of Flowers.

L. Menand & Sons, Albany, N. Y.; first prize, five dollars.
H. Marshall, Mechanicville, N. Y.; second prize, three dollars.

Table Designs.

H. Marshall, Mechanicville, N. Y.; first prize, five dollars.

Rustic Stands.

L. Menand & Sons, Albany, N. Y.; first prize, five dollars.

FRUITS.

PROFESSIONAL LIST.

Twenty-five Varieties of Pears.

Ellwanger & Barry, Rochester, N. Y.; first prize, fifteen dollars.

Twenty Varieties of Pears.

Ellwanger & Barry, Rochester, N. Y.; first prize, ten dollars.

Ten Varieties of Pears.

Ellwanger & Barry, Rochester, N. Y.; first prize, five dollars.

Single Variety of Peaches.

Ellwanger & Barry, Rochester, N. Y.; first prize, two dollars.

Ten Varieties of Plums.

Ellwanger & Barry, Rochester, N. Y.; first prize, five dollars.

Five Varieties of Plums.

Ellwanger & Barry, Rochester, N. Y.; first prize, three dollars.

Single Variety of Plums.

Ellwanger & Barry, Rochester, N. Y.; first prize, two dollars.

Single Variety of Quinces.

Ellwanger & Barry, Rochester, N. Y.; first prize, two dollars.

Ten Varieties of Native Grapes.

Ellwanger & Barry, Rochester, N. Y.; first prize, ten dollars.
Charles J. Copley, Stapleton, N. Y.; second prize, five dollars.

Five Varieties of Native Grapes.

Ellwanger & Barry, Rochester, N. Y.; first prize, five dollars.

Ten Varieties of Foreign Grapes.

Ellwanger & Barry, Rochester, N. Y.; first prize, ten dollars.

Five Varieties of Native Grapes.

Ellwanger & Barry, Rochester, N. Y.; first prize, five dollars.

AMATEUR LIST.

Twenty Varieties of Apples.

C. V. Baker, Cedar Hill, N. Y.; first prize, ten dollars.
M. F. Pierson, Seneca Castle, N. Y.; second prize, five dollars.

Ten Varieties of Apples.

C. V. Baker, Cedar Hill, N. Y.; first prize, five dollars.
P. C. Van Allen, Slingerlands, N. Y.; second prize, three dollars.

Five Varieties of Apples.

P. C. Van Allen, Slingerlands, N. Y.; first prize, three dollars.
George R. Miller, East Greenbush, N. Y.; second prize, two dollars.

Ten Varieties of Pears.

James Sproat, Rochester, N. Y.; first prize, five dollars.
Emily Dorr, Kenwood, N. Y.; second prize, three dollars.

Five Varieties of Pears.

James Sproat, Rochester, N. Y.; first prize, three dollars.
E. Van Allen, Bethlehem Centre, N. Y.; second prize, two dollars.

Five Varieties of Plums.

James Sproat, Rochester, N. Y.; first prize, three dollars.
Mrs. J. H. Loucks, Jerusalem, N. Y.; second prize, two dollars.

Three Varieties of Plums.

Mrs. J. H. Loucks, Jerusalem, N. Y.; first prize, two dollars.
C. V. Baker, Cedar Hill, N. Y.; second prize, one dollar.

Single Variety of Plums.

Mrs. J. H. Loucks, Jerusalem, N. Y.; first prize, one dollar.

Quinces.

James Sproat, Rochester, N. Y.; first prize, two dollars.

SINGLE DISHES OF FRUIT, OPEN TO ALL.

APPLES.

Fall Pippin.

Henry Schoonmaker, Cedar Hill, N. Y.; two dollars.

Gravenstein.

C. V. Baker, Cedar Hill, N. Y.; two dollars.

Baldwin.

Alexander Smith, Nassau, N. Y.; two dollars.

King of Tompkins County.

C. V. Baker, Cedar Hill, N. Y.; two dollars.

Northern Spy.

H. Marshall, Mechanicville, N. Y.; two dollars.

Rhode Island Greening.

M. F. Pierson, Seneca Castle, N. Y.; two dollars.

Roxbury Russet.

Alexander Smith, Nassau, N. Y.; two dollars.

Twenty-ounce.

C. V. Baker, Cedar Hill, N. Y.; two dollars.

Esopus Spitzenberg.

P. C. Van Allen, Slingerlands, N. Y.; two dollars.

PEARS.

Bartlett.

Mrs. J. H. Loucks, Jerusalem, N. Y.; two dollars.

Beurre d'Anjou.

Ellwanger & Barry, Rochester, N. Y.; two dollars.

Beurre Clairgeau.

Ellwanger & Barry, Rochester, N. Y.; two dollars.

Beurre Bosc.

Ellwanger & Barry, Rochester, N. Y.; two dollars.

Duchess d'Angouleme.

Ellwanger & Barry, Rochester, N. Y.; two dollars.

Doyenne Boussock.

Ellwanger & Barry, Rochester, N. Y.; two dollars.

Flemish Beauty.

G. T. Smith, Jonesville, N. Y.; two dollars.

Seckel.

E. Van Allen, Bethlehem Centre, N. Y.; two dollars.

Sheldon.

Henry Schoonmaker, Cedar Hill, N. Y.; two dollars.

Lawrence.

Ellwanger & Barry, Rochester, N. Y.; two dollars.

Winter Nelis.

Ellwanger & Barry, Rochester, N. Y.; two dollars.

GRAPES.

Concord.

David Abrams, New Paltz, N. Y.; two dollars.

Delaware.

David Abrams, New Paltz, N. Y.; two dollars.

AWARDS

AT THE

FORTY-SIXTH ANNUAL CATTLE SHOW AND FAIR OF THE NEW YORK STATE AGRICULTURAL SOCIETY, HELD AT UTICA, SEPTEMBER 23–29, 1886.

CATTLE.

SHORTHORNS.

Shorthorn Herd.

Frank & L. E. Moore, Shoreham, Vt.; large gold medal.

Bull, Duke of Winchester, red, bred by J. N. Winn, Winchester, Ky.; calved, May 3, 1884, sire Duke of Deerlawn, 50968, dam Ella Combs by Bell Duke, 16009, gr. d. Fannie Combs 2d by Pioneer, 12593.

Cow, Rosette 3d, roan, bred by Hall & Taylor, Paris, Ky.; calved July 18, 1877, sire 4th duke of Hillhurst, 21509, dam Rosette by Junius, 6929, gr. d. Easterday by Pearl, 2012.

Cow, Ella Combs, red, bred by J. N. Winn, Winchester, Ky.; calved February, 15, 1878, sire Bell Duke, 16009, dam Fannie Combs 2d by Pioneer, 12592, gr. d. Fannie Combs, by Dick Taylor, 3508.

Heifer, Katie Combs, red, bred by J. N. Winn, Winchester, Ky.; calved December 25, 1883, sire Duke of Deerlawn, 50968, dam Alice Combs by Duke Geneva, 22631, gr. d. Fannie Combs 2d by Pioneer, 12593.

Heifer, Duchess of Sharon 2d, red, bred by W. E. Boyden, Delhi Mills, Mich.; calved June 19, 1884, sire Commander-in-Chief, 47714, dam Rosette 3d by 4th Duke of Hillhurst, 25509, gr. d. Rosette by Junius, 6929.

Heifer, Minnie Combs, red, bred by William Ball, Hamburgh, Mich.; calved April 2, 1885, sire Duke of Crow Farm, 38332, dam Ella Combs by Bell Duke, 16009, gr. d. Fannie Combs 2d by Pioneer, 12593.

Shorthorn Bulls and Produce.

S. Spencer & Son, Kiantone, N. Y.; large gold medal; Conewango Lad 9th.

Shorthorn Bulls, over Three Years Old.

A. F. Stearns & Son, Marion, N. Y.; first prize, fifty dollars; Duke of Aylmer 4th, roan, bred by Canada West Farm Stock Association, Brantford, Canada; calved February 11, 1882, sire 4th Duke of Clarence, 26188, dam Duchess of Aylmer 3d by 4th Duke of Barrington, 16708, gr. d. Duchess of Dereham 6th by Lord Barrington, 17550.

George H. Bell, Rome, N. Y.; second prize, twenty-five dollars; 6th Airdrie Duke of Constance, red, bred by J. Talcott & Son, Rome, N. Y.; calved May 23, 1883, sire Earl of Glen, 55911, dam Lady Constance 3d by Lord Mayor, 6969, gr. d. Constance 4th by Seventh Duke of Airdrie, 5532.

Shorthorn Bulls, Two Years Old.

Frank & L. E. Moore, Shoreham, Vt.; first prize, forty dollars; Duke of Winchester, red, bred by J. N. Winn, Winchester, Ky.; calved May 3, 1884, sire Duke of Deerlawn, 50968, dam Ella Combs by Bell Duke, 16009, gr. d. Fannie Combs 2d by Pioneer, 12593.

John B. Johnson, Rome, N. Y.; second prize, twenty dollars; Earl of Rome, red, with a little white, bred by George H. Bell, Rome, N. Y.; calved March 28, 1884, sire Earl of Glen, 55911, dam Orange Girl by Comet, 22459, gr. d. Bellflower by Prince of Wales, 5100.

Shorthorn Bulls, One Year Old.

M. B. Ritter, Waterloo, N. Y.; first prize, thirty dollars; Chautauqua Duke, red, bred by Thomas Boak & Son, Gerry, N. Y.; calved February 1, 1885, sire Hopeful, 63038, dam Roseberry by Duke of Cumberland, 58590, gr. d. Strawberry by Rock, 64259.

Shorthorn Bull Calves.

Frank & L. E. Moore, Shoreham, Vt.; first prize, twenty dollars; Barrington II, red, bred by exhibitors; calved January 8, 1886, sire Lord Barrington of Vermont, 48619, dam Rowena 14th by Oxford Argyll, 20534, gr. d. Rowena 13th by Velocipede, 9250.

Frank & L. E. Moore, Shoreham, Vt.; second prize, ten dollars; Roan Duke, red, bred by exhibitors; calved February 14, 1886, sire Duke of Winchester, 59649, dam Rowena of Shoreham by Lord Barrington 2d, 30115, gr. d. Rowena 14th by Oxford Argyll, 20534.

Shorthorn Cows, over Three Years Old.

A. F. Stearns & Sons, Marion, N. Y.; first prize, forty dollars; Bride of Clifton, red and white, bred by Benjamin Fellows, Clifton, N. Y.; calved October 18, 1879, sire Earl of Oxford, 35422, dam Bride of

Brant by Lord Barrington, 17550, gr. d. Bride of Greenway by Whittington, 3559.

M. B. Ritter, Waterloo, N. Y.; second prize, twenty dollars; Maud May 2d, red, with a little white, bred by exhibitor; calved May 14, 1877, sire Royal Duke of Waterloo, 18252, dam Flora by Duke of Airdrie, 2743, gr. d. Florida by Colin Campbell, 3763.

Shorthorn Heifers, Two Years Old.

Frank & L. E. Moore, Shoreham, Vt.; first prize, thirty dollars; Duchess of Sharon 2d, red, bred by W. E. Boyden, Delhi Mills, Mich.; calved June 19, 1884, sire Commander-in-Chief, 47714, dam Rosette 3d by 4th Duke of Hillhurst, 21509, gr. d. Rosette by Junius 6929.

Frank & L. E. Moore, Shoreham, Vt.; second prize, fifteen dollars; Katie Combs, red, bred by J. N. Winn, Winchester, Ky.; calved December 25, 1883, sire Duke of Deerlawn, 50968, dam Alice Combs by Duke Geneva, 22631, gr. d. Fannie Combs 2d by Pioneer 12593.

Shorthorn Heifers, One Year Old.

M. B. Ritter, Waterloo, N. Y.; first prize, twenty dollars; Pride of Seneca, red, with a little white, bred by exhibitor; calved March 29, 1885, sire Senator, 71737, dam May Rose by Princess of the River, 12677, gr. d. Flora by Airdrie, 2743.

M. B. Ritter, Waterloo, N. Y.; second prize, twenty dollars; Bessie, red, with a little white, bred by exhibitor; calved February 29, 1885, sire Senator, 71737, dam Princess 3d by Princess of the River, 12677, gr. d. Maud by Warwick, 6282.

Shorthorn Heifer Calves.

John B. Johnson, Rome, N. Y.; first prize, twenty dollars; Princess Victoria, red and white, bred by G. H. Bell, Rome, N. Y.; calved March 30, 1886, sire 6th Airdrie Duke of Constance, 64982, dam Airdrie Lass 2d by Airdrie Duke of Constance, 34343, gr. d. Airdrie Lass by 13th Duke of Airdrie, 5535.

Frank & L. E. Moore, Shoreham, Vt.; second prize, ten dollars; Alice Combs, red, bred by exhibitors; calved March 29, 1886, sire Lord Barrington of Vermont, 48619, dam Ella Combs by Bell Duke, 16009, gr. d. Fannie Combs 2d by Pioneer, 12593.

DEVONS.

Devon Herd.

Banker Brothers, Upsonville, Penn.; large gold medal.

Bull, Prince of Wales 19th, bred by Joseph Hilton, New Scotland, N. Y.; calved January 1, 1878, sire Prince of Wales 11th, 1001, dam

Edith 5th by Prince of Wales, 151, gr. d. Edith 2d by Sachem, 1089.

Cow, Bright Promise, bred by exhibitors; calved April 1, 1875, sire Prince of Wales 12th, 1002, dam Rose of Baltimore 3d by Comet, 420, gr. d. Rose of Baltimore 1st by Bloomfield, 313.

Cow, Rose Banker, bred by exhibitors; calved April 3, 1877, sire Prince of Wales 15th, 1004, dam Rose of Baltimore 3d by Comet, 420, gr. d. Rose of Baltimore 1st by Bloomfield, 313.

Cow, Effie Rose, bred by exhibitors; calved April 2, 1882, sire Prince of Wales 19th, 1919, dam Rose of Baltimore 7th by Prince of Wales 15th, 1004, gr. d. Rose of Baltimore 1st by Bloomfield, 313.

Cow, Effie, bred by exhibitors; calved March 9, 1883, sire Prince of Wales 19th, 1919, dam Rose of Baltimore 7th by Prince of Wales 15th, 1004, gr. d. Rose of Baltimore 1st by Bloomfield, 313.

Heifer, Mary Anna, bred by exhibitors; calved July 2, 1884, sire Prince of Wales 19th, 1919, dam Effie Rose by Prince of Wales 19th, 1919, gr. d. Rose of Baltimore 7th by Prince of Wales 15th, 1004.

Devon Bulls and Produce.

Joseph Hilton, New Scotland, N. Y.; large gold medal; Prince of Wales 20th.

Devon Bulls, over Three Years Old.

Joseph Hilton, New Scotland, N. Y.; first prize, fifty dollars; Prince Tarus, bred by exhibitor; calved January 19, 1883, sire Prince of Wales 20th, 1395, dam Edith 16th by Crown Prince, 434, gr. d. Edith 12th by Prince of Wales, 151.

Banker Brothers, Upsonville, Penn.; second prize, twenty-five dollars; Prince of Wales 19th, bred by Joseph Hilton, New Scotland, N. Y.; calved January 1, 1878, sire Prince of Wales 11th, 1001, dam Edith 5th by Prince of Wales, 151, gr. d. Edith 2d by Sachem, 1089.

Devon Bulls, Two Years Old.

Jonathan Hoag, Tomhannock, N. Y.; first prize, forty dollars; Take-Prize, bred by Banker Brothers, Franklin Forks, Penn.; calved February 21, 1884, sire Prince of Wales 19th, 1919, dam Emily 3d by Prince of Wales 15th, 1004, gr. d. Rose of Baltimore 1st by Bloomfield, 313.

William H. Jones & Son, South Montrose, Penn.; second prize, twenty dollars; Baron Lynhurst, Bred by J. D. Nevins, Philadelphia, Penn.; calved May 31, 1884, sire Lord Nelson 2d, 801, dam Lena Pritchard by Litchfield, 789, gr. d. Peony 2d by Comet, 420.

Devon Bulls, One Year Old.

Joseph Hilton, New Scotland, N. Y.; first prize thirty dollars; Chancellor, bred by exhibitor; calved January 29, 1885, sire Prince of Wales 20th, 1395, dam Lady Jane Edith by Prince of Wales 20th, 1395, gr. d. Edith by Crown Prince, 434.

A. F. Bronson, Vernon, N. Y.; second prize, fifteen dollars; Model Prince, bred by exhibitor; calved September 29, 1885, sire West Shore, 2688, dam Countess of Carnaby by Jeddo, 1809, gr. d. Victoria by Prince Albert Victor, 227½.

Devon Bull Calves.

Jonathan Hoag, Tomhannock, N. Y.; first prize, twenty dollars; Shiloh, bred by exhibitor; calved April 10, 1886, sire Fortune, 2250, dam Meg by Forest King, 1828, gr. d. Belmont by Otto, 1823.

Joseph Hilton, New Scotland, N. Y.; second prize, ten dollars; Prince Imperial, bred by exhibitor; calved January 2, 1886, sire Prince of Wales 20th, 1395, dam Maid of Utica by Prince John H., 2458, gr. d. Edith 12th by Prince of Wales, 151.

Devon Cows, over Three Years Old.

Banker Brothers, Upsonville, Penn.; first prize, forty dollars; Bright Promise, bred by exhibitors; calved April 1, 1875, sire Prince of Wales 12th, 1002, dam Rose of Baltimore 3d by Comet, 420, gr. d. Rose of Baltimore 1st by Bloomfield, 313.

A. F. Bronson, Vernon, N. Y.; second prize, twenty dollars; Countess of Carnaby, bred by exhibitor; calved February 13, 1883, sire Jeddo, 1809, dam Victoria, by Prince Albert Victor, 227½, gr. d. Maid of Honor by Hartland, 655.

Devon Heifers, Two Years Old.

Joseph Hilton, New Scotland, N. Y.; first prize, thirty dollars; Ritie, bred by exhibitor; calved July 12, 1884, sire Prince of Wales 20th, 1395, dam Provincial Maid by King of the Ocean, 766, gr. d. Victoria by Prince Albert Victor, 227½.

Jonathan Hoag, Tomhannock, N. Y.; second prize, fifteen dollars; Snowbound, bred by exhibitor; calved March 11, 1884, sire Forest King, 1828, dam Maud S. by Hartland, 1510, gr. d. Bessie by Frank Chapman, 574.

Devon Heifers, One Year Old.

William H. Jones & Son, South Montrose, Penn.; first prize, twenty dollars; High Hopes, bred by William H. Jones; calved April 12, 1885, sire Knight Templar, 2516, dam Baltimore's Pearl by Jones' Prince of Wales, 751½, gr. d. Rose of Baltimore 5th by Prince of Wales 8th, 1000.

Joseph Hilton, New Scotland, N. Y.; second prize, ten dollars; Belle of Scotland, bred by exhibitor; calved December 1, 1884, sire Prince of Wales 20th, 1395, dam Edith 12th by Prince of Wales, 151, gr. d. Edith 4th by Prince of Wales, 151.

Devon Heifer Calves.

Jonathan Hoag, Tomhannock, N. Y.; first prize, twenty dollars; Modesta, bred by exhibitor; calved March, 1886, sire Fortune, 2250, dam Susy by Lord Lovell, 797, gr. d. Ida 3d by Grant, 638.

A. F. Bronson, Vernon, N. Y.; second prize, ten dollars; Miss Hadley, bred by exhibitor; calved March 13, 1886, sire West Shore, 2688, dam Sunshine by Litchfield, 789, gr. d. Cherry by Connewango, 428.

HEREFORDS.

Hereford Herd.

George N. Bissell, Milford, N. Y.; large gold medal.

Bull, Hampton Wilton, bred by J. H. Arkwright, Hampton Court, England; calved February 4, 1884, sire Turquoise, 22642, dam Pearl 3d by Ivington Boy, 7790, gr. d. Pearl 2d by Sir Hungerford, 2602.

Cow, Bertram 3d, bred by E. Ockey, Hereford, England; calved March 19, 1883, sire Premier, 17723, dam Bertram 2d by Brown Eye, 17739, gr. d. Bertram by Grateful 2d (3144.)

Cow, Daisy, bred by Edward Ockey, Hereford, England; calved April 20, 1883, sire Premier, 17723, dam Spot by Leetham, 17717, gr. d. Lovely by Grateful 2d (3144.)

Heifer, Prosperity, bred by S. Goode, England; calved May 11, 1884, sire Torro, 18072, dam Hopeful 2d by Cremorne, 3061, gr. d. Hopeful by Beau, 3746.

Heifer, Helena, bred by H. R. Hall, Hereford, England; calved June 16, 1884, sire Hotspur, 21721, dam Pretty 4th by Patentee 2d (6592), gr. d. Pretty by Preceptor (4030).

Heifer, Albertra, bred by exhibitor; calved April 4, 1885, sire Auctioneer, 9572, dam Bertram 3d by Premier, 17723, gr. d. Bertram 2d by Browneye (6833).

Hereford Bulls, over Three Years Old.

J. L. Northrop, Westfield, N. Y.; first prize, fifty dollars; Monkhill 4th, bred by T. M. Bennett, Hereford, England; calved June 1, 1883, sire Moonraker 3d, 7675, dam Butterfly 3d by Cupid, 963, gr. d. Butterfly by Kingstone (3893).

George N. Bissell, Milford, N. Y.; second prize, twenty-five dollars; Star of the Vale 4th, bred by E. Grassett, Craven Arms, England; calved August 31, 1883, sire Hartington, 4010, dam Satin 3d by Spark 5th, 3355, gr. d, Satin 2d by Pirate, 3356.

Hereford Bulls, Two Years Old.

George N. Bissell, Milford, N. Y.; first prize, forty dollars; Chevalier, bred by William Tudge, Ludlow, England; calved September 23, 1883, sire Auctioneer, 9572, dam Cinderella by Cannonball, 8352, gr. d. Cobweb by Defence, 8353.

Hereford Bulls, One Year Old.

J. L. Northrop, Westfield, N. Y.; first prize, thirty dollars; Jehu, bred by Northrop Brothers, Westfield, N. Y.; calved April 11, 1885, sire Monkhall 4th, 10383, dam Queen 2d by Premier, 4845, gr. d. Hannah by Character 3d, 4780.

C. E. Pierce, Holland Patent, N. Y.; second prize, fifteen dollars; Superior Lake, bred by G. N. Bissell, Milford, N. Y.; calved April 17, 1885, sire Auctioneer, 9572, dam Pretty Maid 2d by Premier 17723, gr. d.; Pretty Maid by Leetham, (7107).

Hereford Bull Calves.

George N. Bissell, Milford, N. Y.; first prize, twenty dollars; Cyrus Major, bred by exhibitor; calved December 7, 1885, sire Chevalier, 15322, dam Bright Sunbeam 6th by Plantagenet, 9690, gr. d. Bright Sunbeam 3d by Melody, 17705.

Hereford Cows, over Three Years Old.

George N. Bissell, Milford, N. Y.; first prize, forty dollars; Daisy, bred by Edward Ockey, Hereford, England; calved April 20, 1883, sire Premier, 17723, dam Spot by Leetham, 17717, gr. d. Lovely by Grateful 2d (3144).

J. L. Northrop, Westfield, N. Y.; second prize, twenty dollars; Peggy bred by T. J. Carwardine, Leominster, England; calved May 26, 1880, sire Lord Wilton, 4057, dam Alice, by Longhorns (4711), gr. d. Juniata by De Cote (3060).

Hereford Heifers, Two Years Old.

George N. Bissell, Milford, N. Y.; first prize, thirty dollars; Prosperity, bred by S. Goode, England; calved May 11, 1884, sire Torro, 18072, dam Hopeful 2d by Cremorne, 3061, gr. d. Hopeful by Beau, 3746.

George N. Bissell, Milford, N. Y.; second prize, fifteen dollars; bred by H. R. Hall, Hereford, England; calved June 10, 1884, sire Hotspur, 21721, dam Pretty 4th by Patentee 2d (6592), gr. d. Pretty by Preceptor (4030).

Hereford Heifers, One Year Old.

George N. Bissell, Milford, N. Y.; first prize, twenty dollars; Albertra, bred by exhibitor; calved April 4, 1885, sire Auctioneer, 9572, dam Bertram 3d by Premier, 17723, gr. d. Bertram 2d by Brown Eye (6883).

J. L. Northrop, Westfield, N. Y.; second prize, ten dollars; Belle of Westfield, bred by Northrop Brothers, Westfield, N. Y.; calved May 12, 1885, sire Monkhall 4th, 10383, dam Charmer 2d by Premier, 4845, gr. d. Charmer by Dorset, 4950.

Hereford Heifer Calves.

George N. Bissell, Milford, N. Y.; first prize, twenty dollars; Angeline, bred by exhibitor; calved November 20, 1885, sire Chevalier, 15322, dam Sparkle 4th by Little Archer, 11588, gr. d. Sparkle 2d by King Dick, 17710.

J. L. Northrop, Westfield, N. Y.; second prize, ten dollars; Lydia Pinkham, bred by Northrop Brothers, Westfield, N. Y.; calved March 20th, 1886, sire Monkhall 4th, 10383, dam Queen 2d by Premier, 4845, gr. d. Hannah by Character 3d, 4780.

AYRSHIRES.

Ayrshire Herd Prize.

George H. Bell, Rome, N. Y.; large gold medal.

Bull, Winfield 3d, red and white, bred by exhibitor; calved March 17, 1882, sire Winfield Boy, 2610, dam Draxy Miller by Treasurer, 1509, gr. d. Pet by Rob Roy, 325.

Cow, Daisy Tresham, red and white, bred by S. Dering, Utica, N. Y.; calved April 20, 1877, sire Kilmarnock 2d, 2611, dam Kate Tresham by Norval, 762, gr. d. Pet by Rob Roy, 325.

Cow, Lillie, red and white, bred by S. Dering, Utica, N. Y.; calved April 24, 1878, sire Kilmarnock 2d, 2611, dam Daisy Miller by Treasurer, 1509, gr. d. Pet by Rob Roy, 325.

Cow, Maggie Mitchell 4th, red and white, bred by exhibitor; calved May, 1881, sire Prince Albert, 3121, dam Maggie Mitchell by The General, 1498, gr. d. Draxy Miller by Treasurer, 1509.

Heifer, Ethel B., red and white, bred by exhibitor; calved January 19, 1884, sire Winfield 3d, 4039, dam Lillie by Kilmarnock 2d, 2711, gr. d. Draxy Miller by Treasurer, 1509.

Heifer, Maud B., red and white, bred by exhibitor; calved February 23, 1884, sire Winfield 3d, 4039, dam Minnie Frost by Kilmarnock 2d, 2611, gr. d. Pet Brown by The General, 1498.

Ayrshire Bulls and Produce.

George H. Bell, Rome, N. Y.; large gold medal; Winfield 3d.

Ayrshire Bulls, over Three Years Old.

J. O. Magie & Son, Elizabeth, N. J.; first prize, fifty dollars; Stanley, red and white, bred by Thomas Guy & Son, Oshawa, Ont.; calved June, 1882, sire William Wallace, 3814, dam Oshawa Lass 2d by Indian Chief, gr. d. Oshawa Lass by Burns, 3632.

Harper W. Dewey, Sidney Centre, N. Y.; second prize, twenty-five dollars; The Captain, red and white, bred by exhibitor; calved February 27, 1883, sire Orient, 2766, dam Frailty by Mikado, 2251, gr. d. Melody by Peveral, 770.

Ayrshire Bulls, Two Years Old.

Stryker & Jones, Rome, N. Y.; first prize, forty dollars; General Stanwix, dark red and white, bred by exhibitors; calved March 10, 1884, sire Wilson 2d, 2926, dam Ann by Gansevoort, 2612, gr. d. Betsie by Lomond, 680.

William Smith, Rome, N. Y.; second prize, twenty dollars; Roman Prince, red and white, bred by George H. Bell, Rome, N. Y.; calved May, 1884, sire Winfield 3d, 4039, dam Daisy Tresham 2d by Winfield Boy, 2610, gr. d. Daisy Tresham by Kilmarnock 2d, 2611.

Ayrshire Bulls, One Year Old.

George H. Bell, Rome, N. Y.; first prize, thirty dollars; King of the Farm, dark red, white spots on flanks, bred by B. G. Foster, Vernon, N. Y.; calved February 28, 1885, sire Charles Mars of Vernon, 3680, dam Joan 3d by Kilmarnock 25th, 2329, gr. d. Joan, imported in 1879 by P. H. Fowler.

A. D. Harrington, Oxford, N. Y.; second prize, fifteen dollars; Ayr Douglas 3d, dark red and white, bred by exhibitor; calved July 16, 1885, sire Ayr Douglas 2d, 3397, dam Lillie Hawks by Mikado, 2251.

Ayrshire Bull Calves.

George H. Bell, Rome, N. Y.; first prize, twenty dollars; Prince of Oneida, dark red and white, bred by exhibitor; calved September 6, 1885, sire Winfield 3d, 4039, dam Draxy's Daughter by Gansevoort, 2612, gr. d. Draxy Miller by Treasurer, 1509.

Stryker & Jones, Rome, N. Y.; second prize, ten dollars; Albany Boy, dark red and white, bred by exhibitors; calved September 18, 1885, sire Wilson 2d, 2926, dam Duchess of H. by Mars 1st, 2177.

Ayrshire Cows, over Three Years Old.

George H. Bell, Rome, N. Y.; first prize, forty dollars; Daisy Tresham; red and white, bred by S. Dering, Utica, N. Y.; calved April 20, 1877, sire Kilmarnock 2d, 2611, dam Kate Tresham by Norval, 762, gr. d. Pet by Rob Roy, 325.

J. O. Magie & Son, Elizabeth, N. J.; second prize, twenty dollars; Jennie Gray, red and white, bred by S. M. & D. Wells, Wethersfield, Conn.; calved June 29, 1879, sire Duke of Athole, 1744, dam Jenny Wren by Arthur, 952, gr. d. Jenny June by Waverly, 914.

Ayrshire Heifers, Two Years Old.

George H. Bell, Rome, N. Y.; first prize, thirty dollars; Maud B., red and white, bred by exhibitor; calved February 23, 1884, sire Winfield 3d, 4039, dam Minnie Frost by Kilmarnock 2d, 2611, gr. d. Pet Brown by The General, 1498.

Harper W. Dewey, Sidney Centre, N. Y.; second prize, fifteen dollars; Ladyship, red and white, bred by exhibitor; calved November 11, 1883, sire Musician, 3640, dam Fret by Mayor, 2757, gr. d. Margaret by Trump, 2501.

Ayrshire Heifers, One Year Old.

George H. Bell, Rome, N. Y.; first prize, twenty dollars; Daisy Tresham 4th, red and white, bred by exhibitor; calved October 5, 1884, sire Winfield 3d, 4039, dam Daisy Tresham by Kilmarnock 2d, 2611, gr. d. Kate Tresham by Norval, 762.

Stryker & Jones, Rome, N. Y.; second prize, ten dollars; Duchess of H. 2d, red and white, bred by exhibitors; calved September 28th, 1884, sire Wilson 2d, 2926, dam Duchess of H. by Mars 1st, 2177, gr. d. Countess by Sir Thomas Moore, 1469.

Ayrshire Heifer Calves.

B. G. Foster, Vernon, N. Y.; first prize, twenty dollars; Nelly Foster, dark red and white, bred by exhibitor; calved January 1, 1886, sire Charles Mars of Vernon, 3680, dam Pet Brown by The General, 1498, gr. d, Pet by Rob Roy, 235.

A. D. Harrington, Oxford, N. Y.; second prize, ten dollars; Jessie A. D., dark red and white, bred by exhibitor; calved April 14, 1886, sire Dean Masso, 3718, dam Jesse Waldron by Erick, 545, gr. d. Kate by John Gilpin, 222.

HOLSTEIN-FRIESIANS.

Holstein-Friesian Herds.

F. C. Stevens, Attica, N. Y.; large gold medal.

Bull, Constantyn, black and white, bred by H. Stamt, in North Holland; calved March 7, 1882, sire Constantyn (157), dam Betje.

Cow, Rhoda, black and white, bred by Thomas B. Wales, Jr., Iowa City, Iowa; calved November, 30, 1875, sire Roland, 144, dam Texelaar 8th by Zuider Zee 2d, 57, gr. d. Texelaar, imported by W. W. Chenery.

Cow, Jewel, black and white, bred by C. Keiser, Alkmaar, North Holland; calved in April, and imported in December, 1878, by T. C. Maxwell & Brothers, Geneva, N. Y.

Cow, Yuinne, black and white, bred by P. Schouten, Hoogcarspel, North Holland; calved March 10, 1879, imported by exhibitor in 1884.

Cow, Jewel 2d, black and white, bred by T. C. Maxwell & Brothers, Geneva, N. Y.; calved May 27, 1880, sire Ebbo, 236, dam Jewel, imported by T. C. Maxwell & Brothers.

Cow, Tirannia, black and white, bred by C. Ness, Sybecarspel, North Holland; calved March 15, 1883, imported by exhibitor in 1884, sire Jacob 4th (210), dam Nessje. (For exhibition as one of herd only.)

Holstein-Friesian Bulls and Produce.

Smiths, Powell & Lamb, Syracuse, N. Y.; large gold medal; Netherland Prince.

Holstein-Friesian Bulls, over Three Years Old.

Smiths, Powell & Lamb, Syracuse, N. Y.; first prize, fifty dollars; Prince of Artis, black and white, bred by Jan Man, Cz., Beemster, North Holland; calved March 20, 1883, sire Artis (127), dam Lieze 2d.

F. C. Stevens, Attica, N. Y.; second prize, twenty-five dollars; Constantyn, black and white, bred by H. Stamt, in North Holland; calved March 7, 1882, sire Constantyn (157), dam Betje.

Holstein-Friesian Bulls, Two Years Old.

F. C. Stevens, Attica, N. Y.; first prize, forty dollars; Sir Henry of Maplewood, black and white, bred by exhibitor; calved April 24, 1884, sire Hulleman, 866, dam Ononis by Empire, 588, gr. d. Onyx, imported by Gerrit S. Miller in dam Ondine.

J. Emery Brown, Oneida, N. Y.; second prize, twenty dollars; Orator, black, bred by Gerrit S. Miller, Peterboro, N. Y.; calved March 20, 1884, sire Joe, 1002, dam Onyx, imported in dam Ondine, September, 1879, by Gerrit S. Miller.

Holstein-Friesian Bulls, One Year Old.

F. C. Stevens, Attica, N. Y.; first prize, thirty dollars; Jacopo, black and white, bred by exhibitor; calved April 17, 1885, sire Jacob 5th (in Holland), dam Dreda, imported by exhibitor in 1884.

F. C. Stevens, Attica, N. Y.; second prize, fifteen dollars; Nigel, black and white, bred by exhibitor; calved April 5, 1885, sire Cyrus, 2041, dam Cresea, imported by exhibitor in 1883.

Holstein-Friesian Bull Calves.

Smiths, Powell & Lamb, Syracuse, N. Y. ; first prize, twenty dollars ; Clothilde 4th's Imperial, black and white, bred by exhibitors ; calved October 21, 1885, sire Prince Imperial, 1164, dam Clothilde 4th by Netherland Prince, 716, gr. d. Clothilde, imported by exhibitors in 1880.

F. C. Stevens, Attica, N. Y. ; second prize, ten dollars ; Tirannia's Sir Henry, black and white, bred by exhibitor ; calved March 9, 1886, sire Sir Henry of Maplewood, 2933, dam Tirannia, imported by exhibitor, by Jacob 4th, 210.

Holstein-Friesian Cows, over Three Years Old.

F. C. Stevens, Attica, N. Y. ; first prize, forty dollars ; Jewel, black and white, bred by C. Keiser, Alkmaar, North Holland ; calved in April, and imported in December, 1878, by T. C. Maxwell & Brothers, Geneva, N. Y.

Smiths, Powell & Lamb, Syracuse, N. Y.; second prize, twenty dollars; Clothilde, black and white, bred by Y. Hill, Beemster, North Holland; calved March, 1879, imported by exhibitors in 1880.

Holstein-Friesian Heifers, Two Years Old.

F. C. Stevens, Attica, N. Y.; first prize, thirty dollars; Renella Abbekerk, black and white, bred by S. de Yong in North Holland, imported by exhibitor; calved March 9, 1884, sire Abbekerk (206), dam Amerika.

Smiths, Powell & Lamb, Syracuse, N. Y.; second prize, fifteen dollars; Artis Katy, black and white, bred by Jan Stapel, Pz., Blokker, North Holland; calved March 13, 1884, imported by exhibitors in August, 1884.

Holstein-Friesian Heifers, One Year Old.

F. C. Stevens, Attica, N. Y.; first prize, twenty dollars; Rhoda 3d, black and white, bred by exhibitor; calved September 27, 1884, sire Constantyn, 2040, dam Rhoda by Roland, 144, gr. d. Texelaar 8th by Zuider Zee 2d, 57.

Smiths, Powell & Lamb, Syracuse, N. Y.; second prize, ten dollars; Mignonette 4th, black and white, bred by exhibitors; calved October 16, 1884, sire Netherland Prince, 716, dam Mignonette, imported by exhibitors in 1882.

Holstein-Friesian Heifer Calves.

F. C. Stevens, Attica, N. Y.; first prize, twenty dollars; Echo 2d's Constantina, black and white, bred by exhibitor; calved February 19, 1886, sire Constantyn, 2040, dam Echo 2d by Mahomet, 289, gr. d. Echo by Rip Van Winkle, 35.

Smiths, Powell & Lamb, Syracuse, N. Y.; second prize, ten dollars; Executrix 2d, black and white, bred by exhibitors; calved October 27, 1885, sire Prince Imperial, 1164, dam Executrix, imported by exhibitors in 1883.

JERSEYS.

Jersey Herds.

T. R. Proctor, Utica, N. Y.; large gold medal.

Bull, Bunker, smoky fawn, bred by Cooper, Maddux & Co., Reading, O.; calved May 26, 1882, sire Stoke Pogis 5th, 5987, dam Sallie Bunker, imported in 1870 by William Clift, Mystic, Conn.

Cow, Kitty of Jefferson 2d, gray, bred by M. S. Wilcox, Jefferson, N. Y.; calved May 1, 1879, sire Dexter of Jefferson, 5681, dam Kitty of Jefferson by Peter Norman, 1238, gr. d. Kitty 2d by Napoleon, 291.

Cow, La Pucelle, fawn, bred by W. A. Walker, Nyack, N. Y.; calved April 8, 1881, sire Mercutio, 4591, dam Nannette of Allerton by Clifton Prince, 1640, gr. d. Brinca by Plon-Plon, 1111.

Cow, Proctor's Pansy, fawn, bred by exhibitor; calved March 4, 1883, sire Lena's Lenox, 6059, dam La Pucelle by Mercutio, 4591, gr. d. Nannette of Allerton by Clifton Prince, 1640.

Heifer, Miss Alexandre 2d, dark fawn, bred by T. A. Havemeyer, Mahwah, N. J.; calved December 4, 1883, sire Carlo, 5559, dam Miss Alexandre, imported by T. A. Havemeyer.

Heifer, Nellie Rival 2d, fawn and white, bred by T. A. Havemeyer, Mahwah, N. J.; calved December 10, 1884, sire Farmer's Pride, 5560, dam Nellie Rival by Rival, 3762, gr. d. Nellie Le Brocq, imported in 1879 by William Holt. (Entered to compete only in herd.)

Jersey Bulls and Produce.

A. H. Cooley, Little Britain, N. Y.; large gold medal; Mahkeenac.

Jersey Bulls, over Three Years Old.

A. H. Cooley, Little Britain, N. Y.; first prize, fifty dollars; Mahkeenac, dark fawn, bred by Herbert Mead, Goldens Bridge, N. Y.; calved March 27, 1878, sire Cinnabar, 1739, dam Europa by Jupiter, 93, gr. d. Alphea by Saturn, 94.

W. R. Mowry, Oxford, N. Y.; second prize, twenty-five dollars; St. Hel. Sig., gray, bred by Samuel B. Wheeler, Bridgeport, Conn.; calved May 28, 1883, sire Wandeffie, 8219, dam Kaoli by Oxoli, 1922, gr. d. Kalmia by St. Helier, 45.

Jersey Bulls, Two Years Old.

A. B. Curran, Whitesboro, N. Y.; first prize, forty dollars; Eliza's Rajah, reddish fawn and white, bred by exhibitor; calved April 24, 1884, sire Young Rajah, 5810, dam Eliza of Greenvale by Rajah of Greenvale, 2533, gr. d. Eliza, imported in 1869 by John S. Barstow.

A. H. Cooley, Little Britain, N. Y.; second prize, twenty dollars; Lord of Chestnutwood, solid, bred by exhibitor; calved January 6, 1884, sire Ramapo, dam Lucy Gaines' Buttercup by Macgregor, 2178, gr. d. Lucy Gaines by Cameron, 239.

Jersey Bulls, One Year Old.

A. H. Cooley, Little Britain, N. Y.; first prize, thirty dollars; Chestnut-burr, fawn, bred by exhibitor; calved July 4, 1885, sire Ramapo, 4679, dam Frolic of Chestnutwood by Mahkeenac, 3290, gr. d. Arthur's Frolic, imported October, 1872, by A. M. Herkness, Philadelphia, Penn.

George H. Warner, New York Mills, N. Y.; second prize, fifteen dollars; Angelo Scituate, solid, bred by Miller & Sibley, Franklin, Penn.; calved November 27, 1884, sire Michael Angelo, 10116, dam May Dee by Eupidee, 4097, gr. d. May of Lakeside by Micawber, 4796.

Jersey Bull Calves.

E. J. Larrabee, Albany, N. Y.; first prize, twenty dollars; Bijou's Rose's Pogis, squirrel gray, shading black, bred by L. W. & H. W. Simond, Berlin, Ontario; calved October, 1885, sire Canada's John Bull, 8388, dam Bijou's Rose of Berlin, by Sheldon, 5250, gr. d. Bijou of St. Lambert by Lord Lisgar, 1066.

A. H. Cooley, Little Britain, N. Y.; second prize, ten dollars; King of Dover, gray fawn, bred by exhibitor; calved September 15, 1885, sire Ramapo, 4679, dam Queen of Dover by Miramon, 1451, gr. d. Queen of Ocean by Dreadnaught, 1470.

Jersey Cows, over Three Years Old.

T. R. Proctor, Utica, N. Y.; first prize, forty dollars; Kitty of Jefferson 2d, gray, bred by M. S. Wilcox, Jefferson, N. Y.; calved May 1, 1879, sire Dexter of Jefferson, 5681, dam Kitty of Jefferson by Peter Norman, 1238, gr. d. Kitty 2d by Napoleon, 291,

Nathan Brownell, Hubbardsville, N. Y.; second prize, twenty dollars; Duke's Flower, red fawn, bred by D. Le Montais, St. Ouen's, Jersey; calved March 26, 1880, imported in 1882 by A. M. Herkness & Co., Philadelphia, Penn.; sire Duke (237) dam Flower.

Jersey Heifers, Two Years Old.

T. R. Proctor, Utica, N. Y.; first prize, thirty dollars; Miss Alexandre 2d, dark fawn, bred by T. A. Havemeyer, Mahwah, N. J.; calved December 4, 1883, sire Carlo, 5559, dam Miss Alexandre, imported by T. A. Havemeyer.

T. R. Proctor, Utica, N. Y.; second prize, fifteen dollars; Nellie Rival 2d, fawn and white, bred by T. A. Havemeyer, Mahwah, N. J.; calved December 10, 1883, sire Farmer's Pride, 5560, dam Nellie Rival by Rival, 3762, gr. d. Nellie Le Brocq, imported in 1879 by William Holt.

Jersey Heifers, One Year Old.

T. R. Proctor, Utica, N. Y.; first prize, twenty dollars; Proctor's Dolores, fawn, bred by exhibitor; calved December 3, 1884, sire Duke Coomassie, 8409, dam Nutley Dolores by Tommy (209), gr. d. Nutley Alma by Snap (254).

George H. Warner, New York Mills, N. Y.; second prize, ten dollars; Alice Bunker, solid color, bred by exhibitor; calved March 19, 1885, sire Bunker, 9025, dam Amandine by Mohawk, 2269, gr. d. Amanda 2d by Essex of Staatsburgh, 892.

Jersey Heifer Calves.

W. V. Keith, Deansville, N. Y.; first prize, twenty dollars; Queen Steuben, light fawn, bred by H. W. Skerritt, Deansville, N. Y.; calved January 18, 1886, sire King Steuben, 11214, dam Xenia by Norwood, 1077, gr. d. Joey 2d by Ossipee, 697.

H. B. Curran, Whitesboro, N. Y.; second prize, ten dollars; reddish fawn and white, bred by exhibitor; calved December 7, 1885, sire Victor Goldthread, 5593, dam Steuben's Goldenrod by Steuben, 4751, gr. d. Amanda 2d by Essex of Staatsburgh, 892.

GUERNSEYS.

Guernsey Herds.

S. L. Hoxie, South Edmeston, N. Y.; large gold medal.

Bull, Lad of Unadilla, orange fawn, bred by exhibitor; calved October 20, 1882, sire Sir Rowley (23), dam Mayflower Ford, imported August 24, 1882, by exhibitor,

Cow, Dutchess of Brittany, orange fawn, bred by John Putron, Guernsey; calved September 28, 1880, imported August 24, 1882, by exhibitor.

Cow, Gully 5th, orange fawn, bred by John Robin, Jr., St. Sampsons, Guernsey; calved February 15, 1881, imported August 24, 1882, by exhibitor.

Dow, Stella 4th, orange fawn, bred by L. M. T. Le Marchand, Castel, Guernsey; calved May 12, 1882, imported June 16, 1883, by exhibitor.

Cow, Musette Ford, orange fawn, bred by Mony Martel, Castel, Guernsey; calved June 5, 1882, imported June 16, 1883, by exhibitor.

Heifer, Mayflower Ford 2d, orange fawn, bred by exhibitor; calved November 17, 1883, sire Duke of Normandy, 712, dam Mayflower Ford, imported August 24, 1882, by exhibitor.

Guernsey Bulls and Produce.

S. L. Hoxie, South Edmeston, N. Y.; large gold medal; Duke of Normandy.

Guernsey Bulls, over Three Years Old.

S. L. Hoxie, South Edmeston, N. Y.; first prize, fifty dollars; Duke of Normandy, orange fawn and white, bred by F. Carey, Guernsey; calved March 11, 1881, imported August 24, 1882, by exhibitor, sire Cato (137), dam Duchess of Normandy.

B. F. Nutting, Woodville, N. Y.; second prize, twenty-five dollars; Og, fawn and white, bred by Edward Norton, Farmington, Conn.; calved April 19, 1879, sire Malbrook, 23, dam Princess, imported in 1876 by Mason C. Weld.

Guernsey Bulls, Two Years Old.

F. B. Buckley, Valley Falls, N. Y.; first prize, forty dollars; Duke of Easton, yellow fawn and white, bred by John S. Perry, Albany N. Y.; calved January 10, 1884, sire Duke of Albany, 498, dam Susie Jehan, imported May 20, 1882, by S. C. Kent, West Grove, Penn.

Mary P. Bryden, Clinton, N. Y.; second prize, twenty dollars; Ripple-ton, lemon fawn and white, bred by L. W. Ledyard, Cazenovia, N, Y.; calved September 13, 1883, sire Sunshine of Fernwood, 395, dam Maiden Hair, imported September 10, 1880, by L. W. Ledyard, sire Mahy's Charley (125).

Guernsey Bulls, One Year Old.

W. C. Wing, West Laurens, N. Y.; first prize, thirty dollars; King Richard 2d, orange fawn and white, bred by exhibitor; calved July 11, 1885, sire King Richard, 718, dam Princess, imported August 24. 1882, by S. L. Hoxie, Whitestown, N. Y., sire Rival (153).

A. B. Cary, West Winfield, N. Y.; second prize, fifteen dollars; Orchard Boy of Fernwood, fawn and white, bred by L. W. Ledyard, Cazenovia, N. Y.; calved October 1, 1884, sire Sir Fernwood, 490, dam Orchard Girl, imported September 10, 1883, by L. W. Ledyard, sire General Slade (190), dam Marquise.

Guernsey Bull Calves.

S. L. Hoxie, South Edmeston, N. Y.; first prize, twenty dollars; Le Patourel, orange and white, bred by exhibitor; calved April 10, 1886, sire Lad of Unadilla, 717, dam Lisette Ford, imported June 16, 1883, by exhibitor, by Royal George (120), gr. d. Lisette.

Guernsey Cows, over Three Years Old.

W. C. Wing, West Laurens, N. Y.; first prize, forty dollars; Princess May, orange fawn and white, bred by Thomas Roussel, The Vale, Guernsey; calved January 6, 1881, imported August 24, 1882, by S. L. Hoxie, Whitestown, N. Y., sire Rival (153).

S. L. Hoxie, South Edmeston, N. Y.; second prize, twenty dollars; Dolly Ford, orange fawn and white, bred by John J. Le Patourel, St. Peters Port, Guernsey; calved April 30, 1882, imported June 16, 1883, by exhibitor, sire Elegant (10), dam Dolly.

Guernsey Heifers, Two Years Old.

F. B. Buckley, Valley Falls, N. Y.; first prize, thirty dollars; Rhoda, yellow and white, bred by Thomas M. Harvey & Son, West Grove, Penn.; calved July 11, 1884, sire Amber, 145, dam Mignonette, imported February 12, 1881, by S. C. Kent, West Grove, Penn.

W. C. Wing, West Laurens, N. Y.; second prize, fifteen dollars; Princess Maud 2d, orange fawn and white, bred by exhibitor; calved July 20, 1884, sire Roussel, 726, dam Princess Maud, imported August 24, 1882, by S. L. Hoxie, Whitestown, N. Y., sire Rival (153), dam Queen.

Guernsey Heifers, One Year Old.

S. L. Hoxie, South Edmeston, N. Y.; first prize, twenty dollars; Primrose Ford 3d, orange and white, bred by exhibitor; calved April 13, 1885, sire Duke of Normandy, 712, dam Primrose Ford, imported August 24, 1882, by S. L. Hoxie.

S. L. Hoxie, South Edmeston, N. Y.; second prize, ten dollars; Kleiterp, orange and white, bred by exhibitor; calved December 12, 1884, sire Duke of Normandy, 712, dam La Source 2d, imported in dam La Source, June 16, 1883, by S. L. Hoxie, sire Royal George (120).

Guernsey Heifer Calves.

S. L. Hoxie, South Edmeston, N. Y.; first prize, twenty dollars; Gully Dean, orange and white, bred by exhibitor; calved October 1, 1885, sire Duke of Normandy, 712, dam Gully 6th, imported by exhibitor June 16, 1883.

B. F. Nutting, Woodville, N. Y.; second prize, ten dollars; Daisy of Lakeside 2d, fawn and white, bred by exhibitor; calved October 7, 1885, sire Ontario, 743, dam Beauty of Lakeside by Sir Champion, 38, gr. d. Carrie of Green Bank by Pilgrim, 14.

BROWN SWISS.

Brown Swiss Bulls of any age.

Mrs. E. M. S. Nutting, Woodville, N. Y.; first prize, forty dollars; Chetwood Tell of Lehigh, bred by H. Leh, Allentown, Penn.; calved November 5, 1884, sire Woonsittler of Cedar Creek, 77, dam Orange.

Brown Swiss Cows and Heifers of any age.

Mrs. E. M. S. Nutting, Woodville, N. Y.; first prize, forty dollars; Daffodil 3d, bred by exhibitor; calved May 29, 1884, sire Albert Tell, Jr., 28, Daffodil by Robert Tell, 12, gr. d. Estelle.

B. F. Nutting, Woodville, N. Y.; second prize, twenty dollars; Daffodil 4th, bred by exhibitor; calved September 2, 1885, sire Albert Tell, Jr., 28, dam Daffodil by Robert Tell, 12, gr. d. Estelle.

NORFOLK AND SUFFOLK RED-POLLED.

Norfolk and Suffolk Red-Polled Herds.

G. F. Taber, Patterson, N. Y.; large gold medal.

Bull, Rupert, bred by Lord Hastings, Norfolk, England; calved October 22, 1882, sire Roscoe, 559, dam Davy 19th by Davyson 3d, 48, gr. d. Davy 12th by The Baron, 9.

Cow, Rosalie, bred by exhibitor; calved September 28, 1879, sire Champion, 271, dam Rachel by Ravinewood Beau, 160, gr. d. Ravinewood Belle by Hero 3d, 87.

Heifer, Handsome, 3d, bred by R. H. Mason, Norfolk, England; calved October 25, 1883, sire Prince Victor, 914, dam Handsome 2d by Karl, 512, gr. d. Handsome.

Heifer, Phillis, bred by R. H. Mason, Norfolk, England; calved December 8, 1883, sire Straston Duke, 570, dam Pet by Lord Easton, 105, gr. d. Polly.

Heifer, Melton Rose 3d, bred by Lord Hastings, Norfolk, England; calved February 9, 1884, sire Roscoe, 559, dam Melton Rose by Thornham Duke 2d, 585, gr. d. Rosebud by Norfolk John, 131.

Heifer, Roxana, bred by exhibitor; calved January 28, 1885, sire Francillo, 669, dam Ravinewood Belle by Hero 3d, 87, gr. d. Mrs. Rollins.

Norfolk and Suffolk Red-Polled Bulls of any age.

G. F. Taber, Patterson, N. Y.; first prize, forty dollars; Rupert, bred by Lord Hastings, Norfolk, England; calved October 22, 1882, sire Roscoe, 559, dam Davy 19th by Davyson 3d, gr. d. Davy 12th, by The Baron, 9.

Rutson Rea, Lowville, N. Y.; second prize, twenty dollars; Surprise, bred by George P. Squire & Son, Marathon, N. Y.; calved August 11, 1884, sire Frank of Elham (670), dam Bridget of Froston by Lofty (515), gr. d. Bridesmaid 2d by Waxwork (597).

Norfolk and Suffolk Red-Polled Cows and Heifers of any age.

G. F. Taber, Patterson, N. Y.; first prize, forty dollars; Rosalie, bred by exhibitor; calved September 28, 1879, sire Champion, 271, dam Rachel by Ravinewood Beau, 160, gr. d. Ravinewood Belle by Hero 3d, 87.

FAT CATTLE AND OXEN.

Fat Steers, under Four Years.

William C. Fage, Syracuse, N. Y.; first prize, forty dollars, roan.

Fat Cows, over Four Years Old.

F. & L. E. Moore, Shoreham, Vt.; first prize, thirty dollars; Empress 7th (Shorthorn), red, bred by Wooster Blodgett, Dexter, Mich.; calved March 28, 1878, sire 15th Duke of Hillsdale, 16829, dam Empress 4th by Huron, 16049, gr. d. Empress 2d by Hotspur, 4030.

George N. Bissell, Milford, N. Y.; second prize, fifteen dollars; Katy 2d (Hereford), bred by E. Corning, Albany, N. Y.; sire Butler, dam Katy by Comus.

Pairs of Working Oxen, over Four Years Old.

J. R. Thurston, Frankfort Hill, N. Y.; first prize, thirty dollars.

HORSES.

BREEDING AND GROWING STOCK — CLYDESDALES.

Special Prize for the best Stallion of any age, large Gold Medal.

A. S. Cook, Binghamton, N. Y.; British Champion, Jr., black, 16, 7 years, bred by Andrew Maconachie, Oneida, Ontario; sire British Champion, dam by imported Cumberland, gr. d. by Marquis of Clydesdale.

Stallions, over Four Years Old.

Wm. C. McQueen, West Galway, N. Y.; first prize, fifty dollars; Monreith, chestnut, 16.1, 4 years; sire Pride of Dunlop, dam Bell (Brown's) by Abbey Prince, gr. d. Maggie by Merry Tom.

Smiths, Powell & Lamb, Syracuse, N. Y.; second prize, twenty-five dollars; Rufus, bay, 16.1½, 4 years; sire Corsewall, dam Nanny of Crafts.

Stallions, Two Years Old.

Smiths, Powell & Lamb, Syracuse, N. Y.; first prize, thirty dollars; Royal Robert, black, 16.1; sire Sir Robert, dam Lady of the Manor.

Stallions, One Year Old.

B. C. Rumsey, Buffalo, N. Y.; first prize, twenty dollars; Sandy, bay, foaled in November, 1884; sire Sandy Scott, dam Jess by Bank of England.

Smiths, Powell & Lamb, Syracuse, N. Y.; second prize, ten dollars; Excelsior, bay, 15.3; sire Young Duke of Clydesdale, dam Nell Laurie.

Mares, over Four Years Old.

Smiths, Powell & Lamb, Syracuse, N. Y.; first prize, forty dollars; Highland Belle, bay, 16.3, bred by Smiths & Powell, Syracuse, N. Y., foaled May, 1880; sire Ontario Chief, 398, dam Queen of Scots by Cannaby, 177, gr. d. by Netherby, 8.

Smiths, Powell & Lamb, Syracuse, N. Y.; second prize, twenty dollars; Jessamine, brown, white on face, 17, bred by Smiths & Powell, Syracuse, N. Y., foaled April 1, 1882; sire The Brown Glancer, 222, dam Black Madam by Surprise, 19, gr. d. by Loudoun Tom, 18.

Fillies, Two Years Old.

Smiths, Powell & Lamb, Syracuse, N. Y.; first prize, twenty dollars; Jess Annan 2d, bay, 15.2; sire Perfection, dam Jess Annan.

Smiths, Powell & Lamb, Syracuse, N. Y.; second prize, ten dollars; Royal Nellie, bay, 15.3; sire Royal Exchange, dam Nellie Hooper.

PERCHERONS.

Stallions, over Four Years Old.

V. S. Eastman, Waterville, N. Y.; first prize, fifty dollars; Mylord, black, 16.2, foaled 1881, imported by M. W. Dunham, August, 1884; sire Raspail, dam Rose by Black Prince.

Elwood S. Akin, Scipio, N. Y.; second prize, twenty-five dollars; Debonnaire, gray, 16.3, 4 years, imported in 1885 by John W. Akin, Scipio, N. Y.

Stallions, Three Years Old.

John W. Akin, Scipio, N. Y.; first prize, forty dollars; Favori, gray, 16.1, imported in 1884 by exhibitor; sire Favori, dam Margot.

Elwood S. Akin, Scipio, N. Y.; second prize, twenty dollars; Perio, gray, 16.1, imported in 1883 by John W. Akin, Scipio, N. Y.

Stallions, Two Years Old.

Elwood S. Akin, Scipio, N. Y.; first prize, thirty dollars; Serpolio, gray, 15.3, imported in 1885 by John W. Akin, Scipio, N. Y.

John W. Akin, Scipio, N. Y.; second prize, fifteen dollars; Bison, gray, 16.1, imported in 1885 by exhibitor.

Stallions, One Year Old.

John W. Akin, Scipio, N. Y.; second prize, ten dollars; Turena, gray, 15, bred by exhibitor; sire Conquerant.

Mares, over Four Years Old.

Elwood S. Akin, Scipio, N. Y.; first prize, forty dollars; Josephine, dapple gray, 16, 6 years, imported in 1883 by John W. Akin, Scipio, N. Y.; sire Picador, dam Josephine.

Wheeler & Matthews, Cedarville, N. Y.; second prize, twenty dollars; Zura, black, 16, 4 years, imported by M. W. Dunham, Wayne, Ill.; sire Brilliant, dam by Brilliant.

Fillies, Two Years Old.

John W. Akin, Scipio, N. Y.; first prize, twenty dollars; Florence, gray, 16, bred by exhibitor; sire Vallaire, dam Rosaline.

R. E. Coe, Kirkville, N. Y.; second prize, ten dollars; Combola, gray, 16, imported 1884.

Fillies, One Year Old.

Elwood S. Akin, Scipio, N. Y.; first prize, fifteen dollars; Roselle, gray, 15, bred by exhibitor; sire Revier, dam Alma.

CARRIAGE AND COACH HORSES.

Stallions, over Four Years Old.

Redfield & Co., Batavia, N. Y.; first prize, fifty dollars; Pharon 2d, bay, 16.2, foaled 1881, bred at the National Depot of Stallions, Pin, Department of Calvados, imported by F. Delaugh, Lille, France.

J. P. Davis, Verona, N. Y.; second prize, twenty-five dollars; Roscoe, bay, 15.2, 7 years; sire Scotchman.

Stallions, Three Years Old.

Erastus A. Van Velzer, Oneida, N. Y.; first prize, forty dollars; Empire King, chestnut, 15.3, sire Mambrino King, dam Janne by Mambrino Patchen.

Israel J. Young, Miller's Mills, N. Y.; second prize, twenty dollars; gray, 15.3.

Stallions, Two Years Old.

Wheeler & Matthews, Cedarville, N. Y.; first prize, thirty dollars; Brilliant, black, 15.2.

L. Stisser, Wampsville, N. Y.; second prize, fifteen dollars; brown, 15.3.

Mares, over Four Years Old.

L. S. Cook, Binghamton, N. Y.; first prize, forty dollars; Daisy, black, 16, 4 years; sire imported Coachman, dam by Messenger Duroc.

Fillies, Three Years Old.

B. W. Wood, West Schuyler, N. Y.; first prize, thirty dollars; chestnut, 15.

Fillies, Two Years Old.

L. Chandler, Rome, N. Y.; first prize, twenty dollars; Maud C., bay, 15; sire Soreno, dam Fannie by Fox Morgan.

William A. Treen, East Utica, N. Y.; second prize, ten dollars; bay.

Fillies, One Year Old.

A. Chandler, Rome, N, Y.; first prize, fifteen dollars; Golda May, chestnut, 14; sire Soreno, dam Fannie by Fox Morgan.

T. W. Parkinson, North Bridgewater, N. Y.; second prize, five dollars; chestnut, 14.2.

ROADSTERS.

Roadster Sires.

Erastus Corning, Albany, N. Y.; large gold medal; Shawmut.

Stallions, over Five Years Old.

N. B. Mann, Mannville, N. Y.; first prize, seventy dollars; Middletown, Jr., chestnut, 15.2, 11 years, by Middletown, dam by Andrew Jackson.

Erastus Corning, Albany, N. Y.; second prize, thirty-five dollars; Shawmut, bay, 15.3, 9 years, bred by Edwin Thorne, Millbrook, N. Y.; sire Harry Clay, dam Heroine by Rysdyk's Hambletonian, gr. d. Lady Patriot by Patriot.

Stallions, Four Years Old.

John W. Lawyer, Schoharie, N. Y.; first prize, sixty dollars; Young Daniel Lambert, chestnut, 16, foaled June 17, 1882; sire Schoharie Lambert, dam Nellie by Paragon, gr. d. by Mambrino Chief.

D. Baird, Springfield Centre, N. Y.; second prize, thirty dollars; Forest Prince, bay, 15.3, foaled July 12, 1882; sire Hambletonian Prince, dam by Corning's Harry Clay.

Stallions, Three Years Old.

Erastus A. Van Velzer, Oneida, N. Y.; first prize, fifty dollars; Almont Protection, bay, 15.1; sire Hamlin's Almont, Jr., dam Snip by the Cook horse.

Eugene Snow, Knoxboro, N. Y.; second prize, twenty-five dollars; Mambritonian, bay.

Stallions, Two Years Old.

Philip Harter, Herkimer, N. Y.; first prize, forty dollars; dark bay, 15.2.

B. G. Foster, Vernon, N. Y.; second prize, twenty dollars; Foster's Hambletonian Dick, dark chestnut, bred by exhibitor, foaled June 5, 1884; sire Highland Beauty (by Highland Boy), dam Nelly by Royal George, gr. d. by Rysdyk's Hambletonian.

Mares, over Four Years Old.

Erastus Corning, Albany, N. Y.; first prize, fifty dollars; Harriet Clay, black, 16, 6 years, bred by exhibitor; sire Corning's Harry Clay.

Cyrenius Chamberlain, Rockwell's Mills, N. Y.; second prize, twenty-five dollars; Aloha, bay, 15.3, 6 years; sire Autocrat, Jr., dam June by Gen. Grant, gr. d. May Day by Blackbird.

Fillies, Three Years Old.

Charles S. Green, Utica, N. Y.; first prize, forty dollars; Ethel, chestnut, 15.3; sire Young Jim.

D. S. Hill, Sidney Plains, N. Y.; second prize, twenty dollars; Edith, bay, 15.1, bred by exhibitor, foaled July 15, 1883; sire Harry Hill, dam Maggie Clark by Owego Chief.

Fillies, Two Years Old.

Eben M. Benham, Hopewell Centre, N. Y.; first prize, thirty dollars; Maud B., brown; sire Pilot, dam Stella Howard by Monroe Morgan.

J. W. Wight, Whitesboro, N. Y.; second prize, fifteen dollars; bay, 14.3; sire Governor Seymour, dam Kate Smith.

Fillies, One Year Old.

Charles S. Green, Utica, N. Y.; first prize, twenty dollars; bay, 14.2; sire Young Jim.

Erastus A. Van Velzer, Oneida, N. Y.; second prize, ten dollars; Oneida Belle, bay, 14.2; sire Mambrino King, dam Thornhedge by Hamlin's Almont, Jr.

SHETLAND PONIES.

Stallions, over Two Years Old.

G. M. Wood, Woodville, N. Y.; first prize, twenty dollars; black, 12 years.

Stallions, under Two Years Old.

J. F. Converse, Woodville, N. Y.; first prize, fifteen dollars; John, black, 10.

Mares, over Two Years Old.

B. F. Nutting, Woodville, N. Y.; first prize, twenty dollars; black, 10, 6 years, bred by J. F. Converse, Woodville, N. Y.

J. F. Converse, Woodville, N. Y.; second prize, ten dollars; Tulu, black, 10.2.

Fillies, under Two Years Old.

J. F. Converse, Woodville, N. Y.; first prize, fifteen dollars; Myra, black, 10.2.

HARNESS AND SADDLE HORSES.

Draught Pairs.

Elwood S. Akin, Scipio, N. Y.; first prize, fifty dollars; Percheron stallions, gray, 16.2, imported by John W. Akin, Scipio, N. Y.; Joli, 5 years; Superior, 6 years.

Wheeler & Matthews, Cedarville, N. Y.; second prize, twenty-five dollars; Percheron geldings, black, 16, 3 years; sire Belleview.

Coach Pairs.

J. W. Signor, Binghamton, N. Y.; first prize, fifty dollars; bay geldings, 15.3, 6 and 7 years.

F. B. Wheeler, Rome, N. Y.; second prize, twenty-five dollars, bay geldings, 16.2, 6 years.

Phæton Pairs.

M. G. Thomson, Utica, N. Y.; first prize, fifty dollars; Harry and Karl, bay geldings, 15.2, 5 and 6 years; sire Young Jim, dam by Bell Morgan.

H. J. Littaye, Constableville, N. Y.; second prize, twenty-five dollars; bay geldings, 15.2, 6 years; sire Lexington Golddust.

Coupé Horses.

E. J. Clark, Belleville, N. Y.; first prize, thirty dollars; roan gelding, 16, 6 years; sire Bacon's Ethan Allen.

Roadsters.

Seymour S. Bowen, Newport, N. Y.; first prize, thirty dollars; John C., gray, 16; foaled August 25, 1881, sire Esperango, dam Meg Merrilies, gr. d. Effie by Pilot, Jr.

M. J. Everett, Utica, N. Y.; second prize, fifteen dollars; bay gelding, 16, 4 years; sire Young Jim, dam by Honest Allen.

Saddle Horses.

R. M. Bingham, Rome, N. Y.; first prize, thirty dollars; bay, 15.2, 6 years.

R. M. Bingham, Rome, N. Y.; second prize, fifteen dollars; chestnut, 15.3, 6 years.

Ponies (under 13 hands), Broken to Harness or Saddle.

Howard A. De Graff, Fonda, N. Y.; first prize, twenty dollars; dark bay, 6 years.

D. S. Hill, Sidney Plains, N. Y.; second prize, ten dollars; Blanche, black and white, bred by Joseph Juliand, Bainbridge, N. Y.; foaled May 3, 1884: sire Curly, dam Maggie.

JACKS AND MULES.

Jacks.

Henry Burnett, Logan, N. Y.; first prize, thirty dollars; Don Juan, dark brown, 14, 10 years.

A. S. Cook, Binghamton, N. Y.; second prize, fifteen dollars; Romeo, gray, 11, 4 years, bred in New Mexico.

Mules.

Henry Burnett, Logan, N. Y.; first prize, thirty dollars; bay and black, 15, 2 years.

W. W. Thurston, Sauquoit, N. Y.; second prize, fifteen dollars, black, 9 years.

SHEEP, SWINE AND POULTRY.

LONG-WOOLED SHEEP — LEICESTERS.

Rams, Two Years Old or over.

John Lunn, Otsdawa, N. Y.; first prize, twenty dollars; bred by exhibitor.

W. S. Moore, Mt. Upton, N. Y.; second prize, ten dollars; bred by exhibitor.

Rams, One Year Old.

W. S. Moore, Mt. Upton, N. Y.; first prize, twenty dollars; bred by exhibitor.

John Lunn, Otsdawa, N. Y.; second prize, ten dollars; bred by exhibitor.

Ram Lambs.

W. S. Moore, Mt. Upton, N. Y.; first prize, ten dollars; bred by exhibitor.

John Lunn, Otsdawa, N. Y.; second prize, five dollars; bred by exhibitor.

Pens of Ewes, over Two Years Old.

John Lunn, Otsdawa, N. Y.; first prize, twenty dollars; bred by exhibitor.

W. S. Moore, Mt. Upton, N. Y.; second prize, ten dollars; bred by exhibitor.

Pens of Yearling Ewes.

W. S. Moore, Mt. Upton, N. Y.; first prize, twenty dollars; bred by exhibitor.

Pens of Ewe Lambs.

John Lunn, Otsdawa, N. Y.; first prize, ten dollars; bred by exhibitor.

W. S. Moore, Mt. Upton, N. Y.; second prize, five dollars; bred by exhibitor.

COTSWOLDS.

Rams, over Two Years Old.

George Chick, Attica, N. Y.; first prize, twenty dollars; bred by exhibitor.

Daniel McDonald, Jordanville, N. Y.; second prize, ten dollars; bred by exhibitor.

Rams, One Year Old.

Daniel McDonald, Jordanville, N. Y.; first prize, twenty dollars; bred by exhibitor.

George Chick, Attica, N. Y.; second prize, ten dollars; bred by exhibitor.

Ram Lambs.

George Chick, Attica, N. Y.; first prize, ten dollars; bred by exhibitor.

Daniel McDonald, Jordanville, N. Y.; second prize, five dollars; bred by exhibitor.

Pens of Ewes, over Two Years Old.

George Chick, Attica, N. Y.; first prize, twenty dollars; bred by exhibitor.

Daniel McDonald, Jordanville, N. Y.; second prize, ten dollars; bred by exhibitor.

Pens of Yearling Ewes.

George Chick, Attica, N. Y.; first prize, twenty dollars; bred by exhibitor.

George Chick, Attica, N. Y.; second prize, ten dollars; bred by exhibitor.

Pens of Ewe Lambs.

George Chick, Attica, N. Y.; first prize,ten dollars; bred by exhibitor.

Daniel McDonald, Jordanville, N. Y.; second prize, five dollars; bred by exhibitor.

LINCOLNS.

Rams, over Two Years Old.

George H. Bell, Rome, N. Y.; first prize, twenty dollars; bred by exhibitor.

Elmwood Farm, Geneva, N. Y.; second prize, ten dollars.

Rams, One Year Old.

Elmwood Farm, Geneva, N. Y.; first prize, twenty dollars; imported in 1886.

George H. Bell, Rome, N. Y.; second prize, ten dollars; bred by exhibitor.

Ram Lambs.

George H. Bell, Rome, N. Y.; first prize, ten dollars; bred by exhibitor.

Elmwood Farm, Geneva, N. Y.; second prize, five dollars; bred by exhibitor.

Pens of Ewes, over Two Years Old.

George H. Bell, Rome, N. Y.; first prize, twenty dollars; one 4 years old, two 2 years old; bred by exhibitor.

Elmwood Farm, Geneva, N. Y.; second prize, ten dollars; bred by exhibitor.

Pens of Yearling Ewes.

George H. Bell, Rome, N. Y.; first prize, twenty dollars; bred by exhibitor.

W. S. Moore, Mt. Upton, N. Y.; second prize, ten dollars; bred by E. G. Moore.

Pens of Ewe Lambs.

B. G. Foster, Vernon, N.Y.; first prize, ten dollars.

W. S. Moore, Mt. Upton, N. Y.; second prize, five dollars; bred by E. G. Moore.

MIDDLE WOOLED SHEEP — SOUTHDOWNS.

Rams, over Two Years Old.

John Hobart Warren, Hoosick Falls, N. Y.; first prize, twenty dollars; bred by Lord Walsingham.

John Hobart Warren, Hoosick Falls, N. Y.; second prize, ten dollars; bred by exhibitor.

Rams, One Year Old.

John Hobart Warren, Hoosick Falls, N. Y.; first prize, twenty dollars; bred by Lord Walsingham.

John Hobart Warren, Hoosick Falls, N. Y.; second prize, ten dollars; bred by exhibitor.

Ram Lambs.

John Hobart Warren, Hoosick Falls, N. Y.; first prize, ten dollars; bred by exhibitor.

John Hobart Warren, Hoosick Falls, N. Y.; second prize, five dollars; bred by exhibitor.

Pens of Ewes, over Two Years Old.

John Hobart Warren, Hoosick Falls, N. Y.; first prize, twenty dollars; bred by Lord Walsingham.

John Hobart Warren, Hoosick Falls, N. Y.; second prize, ten dollars; bred by Lord Walsingham.

Pens of Yearling Ewes.

John Hobart Warren, Hoosick Falls, N. Y.; first prize, twenty dollars; bred by exhibitor.

Pens of Ewe Lambs.

John Hobart Warren, Hoosick Falls, N. Y.; first prize, ten dollars; bred by exhibitor.

SHROPSHIRES.

Rams, over Two Years Old.

George Ingersoll, Fonda, N. Y.; first prize, twenty dollars; bred by John Evans, Uffington, England.

Lackawanna Breeders' Association, Waverly, Penn.; second prize, ten dollars; Lackawanna.

Rams, One Year Old.

George Ingersoll, Fonda, N. Y.; first prize, twenty dollars; bred by exhibitor.

George Ingersoll, Fonda, N. Y.; second prize, ten dollars; bred by exhibitor.

Ram Lambs.

Lackawanna Breeders' Association, Waverly, Penn.; first prize, ten dollars; bred by exhibitors.

George Ingersoll, Fonda, N. Y.; second prize, five dollars; bred by exhibitor.

Pens of Ewes, over Two Years Old.

George Ingersoll, Fonda, N. Y.; first prize, twenty dollars; bred by Thomas Fenn, Stonebrook House, Downton, Ludlow, Salop, England

Lackawanna Breeders' Association, Waverly, Penn.; second prize, ten dollars.

Pens of Yearling Ewes.

George Ingersoll, Fonda, N. Y.; first prize, twenty dollars; bred by exhibitor.

Lackawanna Breeders' Association, Waverly, Penn.; second prize, ten dollars; bred by exhibitors.

Pens of Ewe Lambs.

George Ingersoll, Fonda, N. Y.; first prize, ten dollars; bred by exhibitor.

John A. Cook and John Lunn, Otego, N. Y.; second prize, five dollars; bred by John A. Cook.

HAMPSHIRES.

Rams, over Two Years Old.

E. M. Benham, Hopewell Centre, N. Y.; first prize, twenty dollars.

Rams, One Year Old.

E. M. Benham, Hopewell Centre, N. Y.; first prize, twenty dollars.

Ram Lambs.

E. M. Benham, Hopewell Centre, N. Y.; first prize, ten dollars.

Pens of Ewes, over Two Years Old.

E. M. Benham, Hopewell Centre, N. Y.; first prize, twenty dollars.

Pens of Yearling Ewes.

E. M. Benham, Hopewell Centre, N. Y.; second prize, ten dollars.

Pens of Ewe Lambs.

E. M. Benham, Hopewell Centre, N. Y.; first prize, ten dollars.

OXFORDSHIRES.

Rams, One Year Old.

Aaron Bordwell, Corfu, N. Y.; first prize, twenty dollars; Siegel, bred by exhibitor.

Ram Lambs.

Aaron Bordwell, Corfu, N. Y.; first prize, ten dollars; bred by Peter Arkell.

Pens of Ewes, over Two Years Old.

Aaron Bordwell, Corfu, N. Y.; first prize, twenty dollars; bred by William Arkell, Gloucestershire, England.

Pens of Yearling Ewes.

Aaron Bordwell, Corfu, N. Y.; first prize, twenty dollars; bred by exhibitor.

Pens of Ewe Lambs.

Aaron Bordwell, Corfu, N. Y.; first prize, ten dollars; bred by exhibitor.

CHEVIOTS.

Rams, over Two Years Old.

William Curry, Hartwick, N. Y.; first prize, twenty dollars; bred by exhibitor.

William Lough, Hartwick, N. Y.; second prize, ten dollars; bred by exhibitor.

Rams, One Year Old.

William Curry, Hartwick, N. Y.; first prize, twenty dollars; bred by exhibitor.

William Lough, Hartwick, N. Y.; second prize, ten dollars; bred by exhibitor.

Ram Lambs.

William Lough, Hartwick, N. Y.; first prize, ten dollars; bred by exhibitor.

William Curry, Hartwick, N. Y.; second prize, five dollars; bred by exhibitor.

Pens of Ewes, over Two Years Old.

Ervin J. Bruce, Pittsfield, N. Y.; first prize, twenty dollars; imported.

B. G. Foster, Vernon, N. Y.; second prize, ten dollars; Maid of Hawick, Cheviot Lass, Cheviot Belle.

Pens of Yearling Ewes.

William Curry, Hartwick, N. Y.; first prize, twenty dollars; bred by exhibitor.

Ervin J. Bruce, Pittsfield, N. Y.; second prize, ten dollars; bred by exhibitor.

Pens of Ewe Lambs.

William Lough, Hartwick, N. Y.; first prize, ten dollars.

Ervin J. Bruce, Pittsfield, N. Y.; second prize, five dollars; bred by exhibitor.

FINE-WOOLED SHEEP.—MERINOS, BRED FOR FINENESS OF WOOL.

Rams, over Three Years Old.

C. D. & C. Kenyon, Center White Creek, N. Y.; first prize, twenty dollars; bred by Carl Heyne.

W. J. Tyler, South Byron, N. Y.; second prize, ten dollars.

Rams, One Year Old.

Davis Cossitt, Onondaga, N. Y.; first prize, twenty dollars; bred by exhibitor.

C. D. & C. Kenyon, Center White Creek, N. Y.; second prize, ten dollars; bred by exhibitors.

Ram Lambs.

Davis Cossitt, Onondaga, N. Y.; first prize, ten dollars; bred by exhibitor.

C. D. & C. Kenyon, Center White Creek, N. Y.; second prize, five dollars; bred by exhibitors.

Pens of Ewes, over Three Years Old.

Davis Cossitt, Onondaga, N. Y.; first prize, twenty dollars; bred by exhibitor.

Howard Tryon, Fleming, N. Y.; second prize, ten dollars; bred by C. R. Jones.

Pens of Ewes, Two Years Old.

W. J. Tyler, South Byron, N. Y.; first prize, twenty dollars.

E. E. Stickney, East Shoreham, Vt.; second prize, ten dollars; bred by exhibitor.

Pens of Yearling Ewes.

Davis Cossitt, Onondaga, N. Y.; first prize, twenty dollars; bred by exhibitor.

W. J. Tyler, South Byron, N. Y.; second prize, ten dollars.

Pens of Ewe Lambs.

Davis Cossitt, Onondaga, N. Y.; first prize, ten dollars; bred by exhibitor.

C. D. & C. Kenyon, Center White Creek, N. Y.; second prize, five dollars; bred by exhibitors.

MERINOS, BRED FOR WEIGHT OF FLEECE.

Rams, over Three Years Old.

Ray & Sherwood, Hemlock Lake, N. Y.; first prize, twenty dollars.

J. T. Stickney, Shoreham, Vt.; second prize, ten dollars; bred by exhibitor.

Rams, Two Years Old.

Ray Brothers, Hemlock Lake, N. Y.; first prize, twenty dollars; bred by exhibitors.

Ray, Wynn & Riley, Hemlock Lake, N. Y.; second prize, ten dollars.

Rams, One Year Old.

J. T. Stickney, Shoreham, Vt.; first prize, twenty dollars; bred by exhibitor.

Stephen Briggs, Penn Yan, N. Y.; second prize, ten dollars; bred by exhibitor.

Ram Lambs.

S. B. James, Hoosick, N. Y.; first prize, ten dollars; bred by exhibitor.

Ray Brothers, Hemlock Lake, N. Y.; second prize, five dollars; bred by exhibitors.

Pens of Ewes, over Three Years Old.

E. E. Stickney, East Shoreham, Vt.; first prize, twenty dollars; bred by exhibitor.

S. B. James, Hoosick, N. Y.; second prize, ten dollars; bred by exhibitor.

Pens of Ewes, Two Years Old.

Ray Brothers, Hemlock Lake, N. Y.; first prize, twenty dollars; bred by exhibitors.

E. E. Stickney, East Shoreham, Vt.; first prize, twenty dollars; bred by exhibitor.

Pens of Yearling Ewes.

Stephen Briggs, Penn Yan, N. Y.; first prize, twenty dollars; bred by exhibitor.

E. E. Stickney, East Shoreham, Vt.; second prize, ten dollars; bred by exhibitor.

Pens of Ewe Lambs.

Stephen Briggs, Penn Yan, N. Y.; first prize, ten dollars; bred by exhibitor.

E. E. Stickney, East Shoreham, Vt.; second prize, five dollars; bred by exhibitor.

MERINOS, BRED FOR LENGTH OF STAPLE.

Rams, Three Years Old or over.

S. B. James, Hoosick, N. Y.; first prize, twenty dollars; bred by S. J. Hallenbeck.

W. S. Moore, Mt. Upton, N. Y.; second prize, ten dollars; bred by exhibitor.

Rams, Two Years Old.

Stephen Briggs, Penn Yan, N. Y.; first prize, twenty dollars; bred by exhibitor.

C. Kenyon, Centre White Creek, N. Y.; second prize, ten dollars; bred by exhibitor.

Rams, One Year Old.

Stephen Briggs, Penn Yan, N. Y.; first prize, twenty dollars; bred by exhibitor.

C. Kenyon, Centre White Creek, N. Y.; second prize, ten dollars; bred by exhibitor.

Ram Lambs.

Davis Cossitt, Onondaga, N. Y.; first prize, ten dollars; bred by exhibitor.

S. B. James, Hoosick, N. Y.; second prize, five dollars; bred by exhibitor.

Pens of Ewes, Three Years Old or over.

C. Kenyon, Centre White Creek, N. Y.; first prize, twenty dollars; bred by exhibitor.

W. S. Moore, Mt. Upton, N. Y.; second prize, ten dollars; bred by exhibitor.

Pens of Ewes, Two Years Old.

W. J. Tyler, South Byron, N. Y.; first prize, twenty dollars.

S. B. & R. C. James, Hoosick, N. Y.; second prize, ten dollars; bred by J. T. & V. Rich.

Pens of Yearling Ewes.

Davis Cossitt, Onondaga, N. Y.; first prize, twenty dollars; bred by exhibitor.

Stephen Briggs, Penn Yan, N. Y.; second prize, ten dollars.

Pens of Ewe Lambs.

Davis Cossitt, Onondaga, N. Y.; first prize, ten dollars; bred by exhibitor.

W. J. Tyler, South Byron, N. Y.; second prize, five dollars.

SWINE.

LARGE WHITE BREEDS.

Herds.

A. A. Webber, Nassau, N. Y.; gold medal.

Boars, over One Year Old.

John S. Harmon, Chatham, N. Y.; first prize, twenty dollars; (Chester white).

Howard Tryon, Fleming, N. Y.; second prize, ten dollars; Young Doctor (Chester white), bred by R. H. Hodgson.

Boars, under One Year Old.

A. A. Webber, Nassau, N. Y.; first prize, twenty dollars; Champion Boy (Chester white), bred by exhibitor; farrowed September 26, 1885, sire Jumbo (by Chief Justice 4th, 2195, out of Maud, 2528), dam Princess.

John S. Harmon, Chatham, N. Y.; second prize, ten dollars; (Chester white).

Sows, over One Year Old.

A. A. Webber, Nassau, N. Y.; first prize, twenty dollars; Columbia (Chester white), bred by A. C. Pepoon, Painesville, O.; farrowed March 25, 1885; sire Snow King, 2171, dam Sally Waters by Todd, 2067, gr. d. Anna Chester.

John S. Harmon, Chatham, N. Y.; second prize, ten dollars; (Chester white).

Sows, under One Year Old.

A. A. Webber, Nassau, N. Y.; first prize, twenty dollars; Perfection (Chester white), bred by exhibitor, farrowed September 26, 1885; sire Jumbo, dam Princess.

Howard Tryon, Fleming, N. Y.; second prize, ten dollars; Beauty (Chester white), bred by exhibitor.

CHESHIRES.

Herds.

Button Brothers, Chittenango, N. Y.; gold medal.

Boars, over One Year Old.

R. E. Coe, Kirkville, N. Y.; first prize, twenty dollars; bred by exhibitor.

Button Brothers, Chittenango, N. Y.; second prize, ten dollars.

Boars, under One Year Old.

E. W. Davis, Oneida, N. Y.; first prize, twenty dollars; Lepidus.
Button Brothers, Chittenango, N. Y.; second prize, ten dollars.

Sows, over One Year Old.

Button Brothers, Chittenango, N. Y.; first prize, twenty dollars.
R. E. Coe, Kirkville, N. Y.; second prize, ten dollars; bred by exhibitor.

Sows, under One Year Old.

E. W. Davis, Oneida, N. Y.; first prize, twenty dollars; Phryne.
Button Brothers, Chittenango, N. Y.; second prize, ten dollars.

POLAND CHINA.

Herds.

George H. Bell, Rome, N. Y.; gold medal; boar, General B.; sows, Black Bess of Rome, Black Bess of Rome 2d, Poland Queen; reserve boar, Black Chief.

Boars, over One Year Old.

George H. Bell, Rome, N. Y.; first prize, twenty dollars; General B., bred by exhibitor; farrowed March 27, 1884.

Boars, under One Year Old.

William Smith, Rome, N. Y.; first prize, twenty dollars; bred by exhibitor.
George H. Bell, Rome, N. Y.; second prize, ten dollars; Black Tom, bred by exhibitor; farrowed January 3, 1886.

Sows, over One Year Old.

James Seeley, Geneva, N. Y.; first prize, twenty dollars; Beauty.
George H. Bell, Rome, N. Y.; second prize, ten dollars; Black Bess of Rome 2d, bred by exhibitor; farrowed July 28, 1885.

Sows, under One Year Old.

James Seeley, Geneva, N. Y.; first prize, twenty dollars; Lily.
George H. Bell, Rome, N. Y.; second prize, ten dollars; Poland Queen, bred by exhibitor; farrowed March 11, 1886.

DUROC—JERSEY.

Herds.

F. D. Curtis, Charlton, N. Y.; gold medal; boar, The Boss; sows, Miss Quackenbush, Mary Louise, Miss Teft's Choice; reserves, boar Grinnell, sow Autumn Beauty.

Boars, over One Year Old.

F. B. Buckley, Valley Falls, N. Y.; first prize, twenty dollars; bred by Dr. A. D. Newell, New Brunswick, N. J.

F. D. Curtis, Charlton, N. Y.; second prize, ten dollars; The Boss.

Boars, under One Year Old.

F. D. Curtis, Charlton, N. Y.; second prize, ten dollars; Longfellow.

Sows, over One Year Old.

F. B. Buckley, Valley Falls, N. Y.; first prize, twenty dollars; bred by Dr. A. D. Newell, New Brunswick, N. J.

F. D. Curtis, Charlton, N. Y.; second prize, ten dollars; Miss Quackenbush.

Sows, under One Year Old.

F. D. Curtis, Charlton, N. Y.; first prize, twenty dollars; Autumn Beauty.

F. D. Curtis, Charlton, N. Y.; second prize, ten dollars; Annie Broadback.

SMALL WHITE BREEDS.

Herds.

A. G. Chriswell, Brockport, N. Y.; gold medal; (small Yorkshire).

Boars, over One Year Old.

C. P. Whitney, Orleans, N. Y.; first prize, twenty dollars; Sir Stephen, bred by T. R. Proctor, Utica, N. Y.

C. P. Whitney, Orleans, N. Y.; second prize, ten dollars; Shortie, bred by exhibitor.

Boars, under One Year Old.

A. G. Chriswell, Brockport, N. Y.; first prize, twenty dollars; (small Yorkshire).

A. G. Chriswell, Brockport, N. Y.; second prize, ten dollars; (small Yorkshire).

Sows, over One Year Old.

A. G. Chriswell, Brockport, N. Y.; first prize, twenty dollars; (small Yorkshire).

C. P. Whitney, Orleans, N. Y.; second prize, ten dollars; Oneida Queen V., bred by T. R. Proctor, Utica, N. Y.

Sows, under One Year Old.

A. G. Chriswell, Brockport, N. Y.; first prize, twenty dollars; (small Yorkshire).

A. G. Chriswell, Brockport, N. Y.; second prize, ten dollars; (small Yorkshire).

BERKSHIRES.

Herds.

T. R. Proctor, Utica, N. Y.; gold medal; boar, Emperor III.; sows, Lucille Western, Lady Maybreeze, Pearl of Oneida.

Boars, over One Year Old.

T. R. Proctor, Utica, N. Y.; first prize, twenty dollars; Bob Toombs, bred by W. T. Miller, Bowling Green, Ky.

T. R. Proctor, Utica, N. Y.; second prize, ten dollars; Emperor III, bred by A. A. McArthur, Coburg, Canada.

Boars, under One Year Old.

T. R. Proctor, Utica, N. Y.; first prize, twenty dollars; Maybreeze Duke, bred by exhibitor.

T. R. Proctor, Utica, N. Y.; second prize, ten dollars; Judge Maybreeze, bred by exhibitor.

Sows, over One Year Old.

T. R. Proctor, Utica, N. Y.; first prize, twenty dollars; Lucille Western, bred by exhibitor.

T. R. Proctor, Utica, N. Y.; second prize, ten dollars; Sallie's Pride.

Sows, under One Year Old.

T. R. Proctor, Utica, N. Y.; first prize, twenty dollars; Emperor's Maid, bred by exhibitor.

T. R. Proctor, Utica, N. Y.; second prize, ten dollars; Bell of Tunis 3d, bred by exhibitor.

ESSEX.

Herds.

H. H. Johnson, Rural Hill, N. Y.; gold medal.

Boars, over One Year Old.

H. H. Johnson, Rural Hill, N. Y.; second prize, ten dollars.

Boars, under One Year Old.

H. M. Jaques, Wright's Corners, N. Y.; first prize, twenty dollars.

E. J. Clark, Belleville, N. Y.; second prize, ten dollars.

Sows, over One Year Old.

H. H. Johnson, Rural Hill, N. Y.; first prize, twenty dollars.

E. J. Clark, Belleville, N. Y.; second prize, ten dollars.

Sows, under One Year Old.

H. M. Jaques, Wright's Corners, N. Y.; first prize, twenty dollars.

H. H. Johnson, Rural Hill, N. Y.; second prize, ten dollars.

POULTRY.

ASIATICS.

Breeding Pens of each variety.

Newton Adams, Utica, N. Y.; first prize, five dollars; dark Brahmas.
Welsey B. Barton, Pittsfield, Mass.; second prize, three dollars; light Brahmas; bred by exhibitor.

Light Brahmas.

Welsey B. Barton, Pittsfield, Mass.; first prize, three dollars; young, bred by exhibitor.
J. R. Draper, Troy, N. Y.; second prize, two dollars; young.
Wm. Conklin, Richfield Springs, N. Y.; third prize, one dollar; young.

Dark Brahmas.

Newton Adams, Utica, N. Y.; first prize, three dollars.
Newton Adams, Utica, N. Y.; second prize, two dollars.
W. J. Kirby, East Chatham, N. Y.; third prize, one dollar.

Buff Cochins.

D. A. Carter, Utica, N. Y.; first prize, three dollars.

Partridge Cochins.

H. A. Jones, Worcester, Mass.; first prize, three dollars.
H. A. Jones, Worcester, Mass.; second prize, two dollars.

White Cochins.

O. Howland & Son, Auburn, N. Y.; first prize, three dollars.
C. L. G. Blessing, Slingerlands, N. Y.; second prize, two dollars.
C. L. G. Blessing, Slingerlands, N. Y.; third prize, one dollar.

Black Cochins.

D. A. Carter, Utica, N. Y.; first prize, three dollars.

Langshans.

E. P. Kirby, East Chatham, N. Y.; first prize, three dollars.
E. P. Kirby, East Chatham, N. Y.; second prize, two dollars.
H. A. Bumpus, De Ruyter, N. Y.; third prize, one dollar.

DORKINGS.

Breeding Pens of each variety.

J. M. Seymour, Clark's Mills, N. Y.; first prize, three dollars; silver gray.

Colored Dorkings.

R. P. Wolcott, Holland Patent, N. Y.; first prize, three dollars.
Edwin H. Warner, New York Mills, N. Y.; second prize, two dollars; young.
Edwin H. Warner, New York Mills, N. Y.; third prize, one dollar.

Silver Gray Dorkings.

Jay M. Seymour, Clark's Mills, N. Y.; second prize, two dollars.

White Dorkings.

H. A. Jones, Worcester, Mass.; first prize, three dollars.
W. J. Kirby, East Chatham, N. Y.; second prize, two dollars.
D. A. Carter, Utica, N. Y.; third prize, one dollar.

AMERICANS.

Breeding Pens of each variety.

Charles B. Gillett, Lebanon Springs, N. Y.; first prize, five dollars; Wyandottes, young, bred by exhibitor.
Wesley B. Barton, Pittsfield, Mass.; second prize, three dollars; Plymouth Rocks, young, bred by exhibitor.

American Dominiques.

Jones Wilcox, East Chatham, N. Y.; first prize, three dollars.
Jones Wilcox, East Chatham, N. Y.; second prize, two dollars.
O. Howland & Son, Auburn, N. Y.; third prize, one dollar.

Plymouth Rocks.

Wesley B. Barton, Pittsfield, Mass.; first prize, three dollars.
Newton Adams, Utica N. Y.; second prize, two dollars.
Jones Wilcox, East Chatham, N. Y.; third prize, one dollar.

Wyandottes.

Charles B. Gillet, Lebanon Springs, N. Y.; first prize, three dollars; young, bred by exhibitor.
Jones Wilcox, East Chatham, N. Y.; second prize, two dollars.
Wesley B. Barton, Pittsfield, Mass.; third prize, one dollar; young, bred by exhibitor.

White Wyandottes.

Knapp Brothers, Fabius, N. Y.; first prize, three dollars.
J. M. Dexter, Camden, N. Y.; second prize, two dollars; young.
D. G. Douglass, Washington Mills, N. Y.; third prize, one dollar; young, bred by exhibitor.

Black Javas.

James Seeley, Geneva, N. Y.; first prize, three dollars.
James Seeley, Geneva, N. Y.; second prize, two dollars.
C. L. G. Blessing, Slingerlands, N. Y.; third prize, one dollar.

HAMBURGHS.

Breeding Pens of each variety.

Jones Wilcox, East Chatham, N. Y.; first prize, five dollars; silver spangled.
Charles L. Seeley, Afton, N. Y.; second prize, three dollars; black.

Golden Spangled Hamburghs.

James Seeley, Geneva, N. Y.; first prize, three dollars.
Ervin J. Bruce, Pittsfield, N. Y.; second prize, two dollars.
Ervin J. Bruce, Pittsfield, N. Y.; third prize, one dollar.

Silver Spangled Hamburghs.

Jones Wilcox, East Chatham, N. Y.; first prize, three dollars.
Jones Wilcox, East Chatham, N. Y.; second prize, two dollars.
James Hagins, Utica, N. Y.; third prize, one dollar.

Golden Penciled Hamburghs.

John Stewart, Eaton, Penn.; first prize, three dollars.
O. Howland & Son, Auburn, N. Y.; second prize, two dollars.

Silver Penciled Hamburghs.

O. Howland & Son, Auburn, N. Y.; first prize, three dollars.
H. A. Jones, Worcester, Mass.; second prize, two dollars.

Black Hamburghs.

O. Howland & Son, Auburn, N. Y.; first prize, three dollars.
Charles L. Seeley, Afton, N. Y; second prize, two dollars.

SPANISH.

Breeding Pens of each variety.

Knapp Brothers, Fabius, N. Y.; first prize, five dollars; white Leghorns.
Earl Barney, Schenectady, N. Y.; second prize, three dollars; brown Leghorns.

Black Spanish.

D. A. Carter, Utica, N. Y.; first prize, three dollars.
O. Howland & Son, Auburn, N. Y.; second prize, two dollars.
John Stewart, Eaton, Penn.; third prize, one dollar.

White Leghorns.

Knapp Brothers, Fabius, N. Y.; first prize, three dollars.
James Seeley, Geneva, N. Y.; second prize, two dollars.
Knapp Brothers, Fabius, N. Y.; third prize, one dollar.

Brown Leghorns.

Earl Barney, Schenectady, N. Y.; first prize, three dollars.
Jones Wilcox, East Chatham, N. Y.; second prize, two dollars.
O. Howland & Son, Auburn, N. Y.; third prize, one dollar.

Black Leghorns.

Earl Barney, Schenectady, N. Y.; first prize, three dollars; young.
C. L. G. Blessing, Singerlands, N. Y.; second prize, two dollars.
C. L. G. Blessing, Singerlands, N. Y.; third prize, one dollar.

Andalusians.

W. J. Kirby, East Chatham, N. Y.; first prize, three dollars.

FRENCH.

Breeding Pens of each variety.

Jay M. Seymour, Clark's Mills, N. Y.; first prize, five dollars; Crevecœurs.

Crevecœurs.

Jay M. Seymour, Clark's Mills, N. Y.; first prize, three dollars.

Houdans.

Button Brothers, Chittenango, N. Y.; first prize, three dollars.
Michael Ryan, Utica, N. Y.; second prize, two dollars; bred by exhibitor.
Michael Ryan, Utica, N. Y.; third prize, one dollar; bred by exhibitor.

POLISH.

Breeding Pens of each variety.

Charles L. Seeley, Afton, N. Y.; first prize, five dollars; white-crested black.
Charles L. Seeley, Afton, N. Y.; second prize, three dollars; white-crested white.

White-crested Black Polish.

Charles L. Seeley, Afton, N. Y.; first prize, three dollars.
Charles L. Seeley, Afton, N. Y.; second prize, two dollars.
Charles L. Seeley, Afton, N. Y.; third prize, one dollar.

White Polish.

Charles L. Seeley, Afton, N. Y.; first prize, three dollars.
Charles L. Seeley, Afton, N. Y.; second prize, two dollars.

Golden Polish.

Wesley B. Barton, Pittsfield, Mass.; first prize, three dollars; young.
A. F. Bronson, Vernon, N. Y.; second prize, two dollars.

Silver Polish.

James Seeley, Geneva, N. Y.; first prize, three dollars.
O. Howland & Son, Auburn, N. Y.; second prize, two dollars.

GAMES.

Breeding Pens of each variety.

T. K. Bennett, Phillipsburg, N. J.; first prize, three dollars; brown-breasted red.
T. K. Bennett, Phillipsburg, N. J.; second prize, two dollars; brown-breasted red.

Black-breasted Red Games.

T. K. Bennett, Phillipsburg, N. J.; first prize, three dollars.
Westervelt Haywood, Rutherford, N. J.; second prize, two dollars.
O. Howland & Son, Auburn, N. Y.; third prize, one dollar.

Brown-breasted Red Games.

T. K. Bennett, Phillipsburg, N. J.; first prize, three dollars.
Westervelt Haywood, Rutherford, N. J.; second prize, two dollars.

Silver Duckwing Games.

F. J. Webber, Syracuse, N. Y.; first prize, three dollars.

Yellow Duckwing Games.

James Seeley, Geneva, N. Y.; first prize, three dollars.

Red Pile Games.

D. A. Carter, Utica, N. Y.; first prize, three dollars.
O. Howland & Son, Auburn, N. Y.; second prize, two dollars.
T. R. Proctor, Utica, N. Y.; third prize, one dollar.

Black Games.

Erastus A. Van Velzer, Oneida, N. Y.; first prize, three dollars.
Erastus A. Van Velzer, Oneida, N. Y.; second prize, two dollars; young.

GAME BANTAMS.

Breeding Pens of each variety.

T. K. Bennett, Phillipsburg, N. J.; first prize, five dollars; silver duckwing.

Westervelt Haywood, Rutherford, N. J.; second prize, three dollars; black-breasted red.

Black-breasted Red Game Bantams.

John Stewart, Eaton, Penn.; first prize, three dollars; young.

Westervelt Haywood, Rutherford, N. J.; second prize, two dollars; young.

Westervelt Haywood, Rutherford, N. J.; third prize, one dollar.

Brown-breasted Red Game Bantams.

Westervelt Haywood, Rutherford, N. J.; first prize, three dollars.

Westervelt Haywood, Rutherford, N. J.; second prize, two dollars; young.

Red Pile Game Bantams.

Westervelt Haywood; Rutherford, N. J.; first prize, three dollars.

Westervelt Haywood, Rutherford, N. J.; second prize, two dollars; young.

John Stewart, Eaton, Penn.; third prize, one dollar.

White Game Bantams.

Westervelt Haywood, Rutherford, N. J.; first prize, three dollars.

Silver Duckwing Game Bantams.

T. K. Bennett, Phillipsburg, N. J.; first prize, three dollars.

Westervelt Haywood, Rutherford, N. J.; second prize, two dollars.

O. Howland & Son, Auburn, N. Y.; third prize, one dollar.

Yellow Duckwing Game Bantams.

Westervelt Haywood, Rutherford, N. J.; first prize, three dollars; young.

T. K. Bennett, Phillipsburg, N. J.; second prize, two dollars.

O. Howland & Son, Auburn, N. Y.; third prize, one dollar.

Black Game Bantams.

H. A. Jones, Worcester, Mass.; second prize, two dollars.

BANTAMS, OTHER THAN GAME.

Breeding Pens of each variety.

F. J. Webber, Syracuse, N. Y.; first prize, five dollars; Golden Sebright.

Golden Sebright.

Charles C. Giles, Troy, N. Y.; first prize, three dollars.
F. J. Webber, Syracuse, N. Y.; second prize, two dollars.

Silver Sebright.

Westervelt Haywood, Rutherford, N. J.; first prize, three dollars; young.
Westervelt Haywood, Rutherford, N. J.; second prize, two dollars.

Rose-combed Black.

H. A. Jones, Worcester, Mass.; first prize, three dollars.
O. Howland & Son, Auburn, N. Y.; second prize, two dollars.
C. L. G. Blessing, Slingerlands, N. Y.; third prize, one dollar.

Pekin or Cochin.

Jones Wilcox, East Chatham, N. Y.; first prize, three dollars.
Westervelt Haywood, Rutherford, N. J.; second prize, two dollars.
Jones Wilcox, East Chatham, N. Y.; third prize, one dollar.

TURKEYS.

Bronze.

James Seeley, Geneva, N. Y.; first prize, five dollars.
James Seeley, Geneva, N. Y.; second prize, three dollars.
John S. Harmon, Chatham, N. Y.; third prize, two dollars.

White.

O. Howland & Son, Auburn, N. Y.; first prize, five dollars.
D. A. Carter, Utica, N. Y.; third prize, two dollars.

GEESE.

Toulouse.

James Seeley, Geneva, N. Y.; first prize, five dollars.
James Seeley, Geneva, N. Y.; second prize, three dollars.
Thomas W. Jones, Maynard, N. Y.; third prize, two dollars.

Embden.

N. Barns, New Hartford, N. Y.; first prize, five dollars.
Thomas W. Jones, Maynard, N. Y.; second prize, three dollars.
Thomas W. Jones, Maynard, N. Y.; third prize, two dollars.

White Chinese.

C. L. G. Blessing, Slingerlands, N. Y.; first prize, five dollars.
C. L. G. Blessing, Slingerlands, N. Y.; second prize, three dollars.
C. L. G. Blessing, Slingerlands, N. Y.; third prize, two dollars.

Brown Chinese.

C. L. G. Blessing, Slingerlands, N. Y.; first prize, five dollars.
B. G. Foster, Vernon, N. Y.; second prize, three dollars.
C. L. G. Blessing, Slingerlands, N. Y.; third prize, two dollars.

African.

Th mas W. Jones, Maynard, N. Y.; third prize, two dollars.

Wild.

O. Howland & Son, Auburn, N. Y.; first prize, five dollars.

DUCKS.

Rouen.

Jay M. Seymour, Clark's Mills, N. Y.; first prize, three dollars.
Button Brothers, Chittenango, N. Y.; second prize, two doliars.
O. Howland & Son, Auburn, N. Y.; third prize, one dollar.

Aylesbury.

W. J. Kirby, East Chatham, N. Y.; first prize, three dollars.
W. J. Kirby, East Chatham, N. Y.; second prize, two dollars.
C. L. G. Blessing, Slingerlands, N. Y.; third prize, one dollar.

Cayuga.

C. L. G. Blessing, Slingerlands, N. Y.; first prize, three dollars.
H. A. Jones, Worcester, Mass.; second prize, two dollars.
Harry Yates, Rochester, N. Y.; third prize, one dollar.

White Muscovy.

C. L. G. Blessing, Slingerlands, N. Y.; second prize, two dollars.

Colored Muscovy.

C. L. G. Blessing, Slingerlands, N. Y.; first prize, three dollars.
C. L. G. Blessing, Slingerlands, N. Y.; second prize, two dollars.
H. A. Jones, Worcester, Mass.; third prize, one dollar.

Pekin.

James Seeley, Geneva, N. Y.; first prize, three dollars.
Jones Wilcox, East Chatham, N. Y.; second prize, two dollars.
Wesley B. Barton, Pittsfield, Mass.; third prize, one dollar; bred by exhibitor.

White Crested.

H. A. Jones, Worcester, Mass.; first prize, three dollars.

ORNAMENTAL FOWLS.

Pearl Guinea Fowls.

William A. Hoyt, Galway, N. Y.; first prize, three dollars.
H. A. Jones, Worcester, Mass.; second prize, two dollars.
C. L. G. Blessing, Slingerlands, N. Y.; third prize, one dollar.

White Guinea Fowls.

William A. Hoyt, Galway, N. Y.; first prize, three dollars.
O. Howland & Son, Auburn, N. Y.; second prize, two dollars.
C. L. G. Blessing, Slingerlands, N. Y.; third prize, one dollar.

PIGEONS.

Pouters.

Jacob Bauer, Utica, N. Y.; first prize, three dollars; blue pied.
Jacob Bauer, Utica, N. Y.; second prize, two dollars; black pied.

Pigmy Pouters.

Mathias Cook, Utica, N. Y.; first prize, three dollars; white bruener pigmy.
Mathias Cook, Utica, N. Y.; second prize, two dollars; yellow bruener pigmy.

Carriers.

Mathias Cook, Utica, N. Y.; first prize, three dollars; black.
Thomas W. Jones, Maynard, N. Y.; second prize, two dollars; black.
Richard F. A. Nitzschke, Utica, N. Y.; third prize, one dollar; white.

Antwerps.

Mathias Cook, Utica, N. Y.; first prize, three dollars; silver dun.
Mathias Cook, Utica, N. Y.; second prize, two dollars; blue.
Richard F. A. Nitzschke, Utica, N. Y.; third prize, one dollar; red.

Tumblers.

Jacob Bauer, Utica, N. Y.; first prize, three dollars; yellow.
Mathias Cook, Utica, N. Y.; second prize, two dollars; Copenhagen.
C. P. Whitney, Orleans, N. Y.; third prize, one dollar; black.

Barbs.

Thomas W. Jones, Maynard, N. Y.; third prize, one dollar; red.

Turbits, Winged.

Thomas W. Jones, Maynard, N. Y.; first prize, three dollars; black tailed.
Mathias Cook, Utica, N. Y.; second prize, two dollars.

Owls, Solid Color.

Mathias Cook, Utica, N. Y.; first prize, three dollars; white Chinese.
Thomas W. Jones, Maynard, N. Y.; second prize, two dollars; blue.
Jacob Bauer, Utica, N. Y.; third prize, one dollar; blue.

Fantails.

Mathias Cook, Utica, N. Y.; first prize, three dollars; white.
Jacob Bauer, Utica, N. Y.; second prize, two dollars; black.
Mathias Cook, Utica, N. Y.; third prize, one dollar; black crested.

Jacobins.

Jacob Bauer, Utica, N. Y.; first prize, three dollars; red.
Jacob Bauer, Utica, N. Y.; second prize, two dollars; black mottled.
Jacob Bauer, Utica, N. Y.; third prize, one dollar; yellow.

Ring Doves.

Stephen Treen, East Utica, N. Y.; first prize, three dollars.
Mathias Cook, Utica, N. Y.; second prize, two dollars.
C. P. Whitney, Orleans, N. Y.; third prize, one dollar.

Collections of Pouters.

Mathias Cook, Utica, N. Y.; first prize, three dollars.
Stephen Treen, East Utica, N. Y.; second prize, two dollars.

Collections of Fantails.

Mathias Cook, Utica, N. Y.; first prize, three dollars.
Richard F. A. Nitzschke, Utica, N. Y.; second prize, two dollars.

Collections of Antwerps.

Mathias Cook, Utica, N. Y.; first prize, three dollars.
Richard F. A. Nitzschke, Utica, N. Y.; second prize, two dollars.

RABBITS.

Lop-Eared.

Harry Yates, Rochester, N. Y.; first prize, three dollars.
Harry Yates, Rochester, N. Y.; second prize, two dollars.
Harry Yates, Rochester, N. Y.; third prize, one dollar.

Angora.

Harry Yates, Rochester, N. Y.; first prize, three dollars.
C. P. Whitney, Orleans, N. Y.; second prize, two dollars.
William A. Treen, East Utica, N. Y.; third prize, one dollar; bred by exhibitor.

Himalayan.

Richard F. A. Nitzschke, Utica, N. Y.; first prize, three dollars.

COLLIE DOGS.

Scotch Collie Dogs.

J. R. Draper, Troy, N. Y.; first prize, five dollars.
H. H. Johnson, Rural Hill, N. Y.; second prize, three dollars.

Scotch Collie Bitches.

J. R. Draper, Troy, N. Y.; first prize, five dollars.
Wesley B. Barton, Pittsfield, Mass.; second prize, three dollars; bred by exhibitor.

Scotch Collie Bitches and Litters.

H. H. Johnson, Rural Hill, N. Y.; first prize, five dollars.
J. R. Draper, Troy, N. Y.; second prize, three dollars.

HATCHING APPARATUS.

Incubators in Operation.

Brockner & Evans, New York city; first prize, ten dollars.

Artificial Mothers or Brooders.

Brockner & Evans, New York city; first prize, ten dollars.

Models of Houses for Rearing Chickens.

E. A. Wendell, Albany, N. Y.; second prize, three dollars.

FARM PRODUCE.

GRAIN, SEEDS AND HOPS, GROWN IN 1886.

White Winter Wheat.

J. V. H. Scoville, New Hartford, N. Y.; first prize, ten dollars; Clawson.
Charles N. Tuttle, Clockville, N. Y.; second prize, five dollars.

Red Winter Wheat.

Charles Coolidge, Phelps, N. Y.; first prize, ten dollars; Mediterranean.
E. Van Allen, Bethlehem Centre, N. Y.; second prize, five dollars; High-grade.

Spring Wheat.

P. C. Van Allen, Slingerlands, N. Y.; first prize, ten dollars.
Peter Campbell, Green's Landing, Penn.; second prize, five dollars; Pearl.

Winter Rye.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, ten dollars.
Peter Campbell, Green's Landing, Penn.; second prize, five dollars; Pennsylvanian.

Spring Rye.

P. C. Van Allen, Slingerlands, N. Y.; first prize, ten dollars.

Peter Campbell, Green's Landing, Penn.; second prize, five dollars; Australian.

White Oats.

Peter Campbell, Green's Landing, Penn.; first prize, ten dollars; Welcome.

C. P. Whitney, Orleans, N. Y.; second prize, five dollars.

Black or Gray Oats.

Myron F. Pierson, Seneca Castle, N. Y.; first prize, ten dollars.

Peter Campbell, Green's Landing, Penn.; second prize, five dollars; Champion.

Winter Barley.

Peter Campbell, Green's Landing, Penn.; first prize, ten dollars; Kinver's.

Seymour P. Johnson, East Schuyler, N. Y.; second prize, five dollars.

Four-rowed Spring Barley.

Peter Campbell, Green's Landing, Penn.; first prize, ten dollars.

William Watson, Whitesboro, N. Y.; second prize, five dollars.

Manshury Barley.

Peter Campbell, Green's Landing, Penn.; first prize, ten dollars.

Yellow Indian Corn, Shelled.

George H. Mathers, Stanwix, N. Y.; first prize, ten dollars.

Large Field Beans.

Charles N. Tuttle, Clockville, N. Y.; first prize, ten dollars.

L. L. French, Richfield Springs, N. Y.; second prize, five dollars.

Small Field Beans.

P. C. Van Allen, Slingerlands, N. Y.; first prize, ten dollars.

E. Van Allen, Bethlehem Centre, N. Y.; second prize, five dollars.

Large Field Peas.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, ten dollars.

L. L. French, Richfield Springs, N. Y.; second prize, five dollars.

Small Field Peas.

L. L. French, Richfield Springs, N. Y.; first prize, ten dollars.

George H. Mathers, Stanwix, N. Y.; second prize, five dollars.

Buckwheat.

Peter Campbell, Green's Landing, Penn.; first prize, five dollars; silver hull.

Charles N. Tuttle, Clockville, N. Y.; second prize, three dollars.

Timothy Seed.

Seymour P. Johnson, East Schuyler, N. Y.; first prize, five dollars.

Charles N. Tuttle, Clockville, N. Y.; second prize, three dollars.

Millet.

E. Van Allen, Bethlehem Centre, N. Y.; second prize, three dollars.

Flax Seed.

Peter Campbell, Green's Landing, Penn.; first prize, five dollars; Russian.

Charles Coolidge, Phelps, N. Y.; second prize, three dollars.

Sorghum Seed.

Myron F. Pierson, Seneca Castle, N. Y.; first prize, five dollars.

Seed Ears Yellow Corn, Eight-rowed.

Charles N. Tuttle, Clockville, N. Y.; first prize, five dollars.

J. V. H. Scoville, New Hartford, N. Y.; second prize, three dollars.

Seed Ears Yellow Corn, Twelve-rowed.

J. F. Barns, Kirkland, N. Y.; first prize, five dollars.

Jones Wilcox, East Chatham, N. Y.; second prize, three dollars.

Seed Ears White Corn.

P. C. Van Allen, Slingerlands, N. Y.; first prize, five dollars.

Myron F. Pierson, Seneca Castle, N. Y.; second prize, three dollars.

Seed Ears Dent Corn.

Charles Coolidge, Phelps, N. Y.; first prize, five dollars.

J. V. H. Scoville, New Hartford, N. Y.; second prize, three dollars.

Seed Ears Early Sweet Corn.

Myron F. Pierson, Seneca Castle, N. Y.; first prize, five dollars.

A. A. Webber, Nassau, N. Y.; second prize, three dollars.

Seed Ears Late Sweet Corn.

Stryker & Jones, Rome, N. Y.; first prize, five dollars.

Charles N. Tuttle, Clockville, N. Y.; second prize, three dollars.

VEGETABLES.

Celery.

Howard Brothers, Irondequoit, N. Y.; first prize, three dollars.
William A. Treen, East Utica, N. Y.; second prize, two dollars; dwarf.

Cauliflowers.

Lewis Groffman, South Syracuse, N. Y.; first prize, three dollars.
Michael Torpy, Utica, N. Y.; second prize, two dollars.

Cabbages.

Lewis Groffman, South Syracuse, N. Y.; first prize, three dollars.
Howard Brothers, Irondequoit, N. Y.; second prize, two dollars.

Lettuce.

Howard Brothers, Irondequoit, N. Y.; first prize, three dollars.
Lewis Groffman, South Syracuse, N. Y.; second prize, two dollars.

Turnips.

Howard Brothers, Irondequoit, N. Y.; first prize, three dollars.
Myron F. Pierson, Seneca Castle, N. Y.; second prize, two dollars.

Mangolds.

Myron F. Pierson, Seneca Castle, N. Y.; first prize, three dollars.
James Hagins, Utica, N. Y.; second prize, two dollars.

Beets.

Francis Bradt, Jerusalem, N. Y.; first prize, three dollars.
John Bradt, Bethlehem Centre, N. Y.; second prize, two dollars.

Orange Carrots.

Michael Torpy, Utica, N. Y.; first prize, three dollars.
H. W. Skerritt, Deansville, N. Y.; second prize, two dollars.

White Carrots.

Lewis Groffman, South Syracuse, N. Y.; first prize, three dollars.
C. P. Whitney, Orleans, N. Y.; second prize, two dollars.

Parsnips.

Howard Brothers, Irondequoit, N. Y.; first prize, three dollars.
James Hagins, Utica, N. Y.; second prize, two dollars.

Salsify.

Stephen Treen, Utica, N. Y.; first prize, three dollars.
Howard Brothers, Irondequoit, N. Y.; second prize, two dollars.

Kohl-Rabi.

Howard Brothers, Irondequoit, N. Y.; first prize, three dollars.
Myron F. Pierson, Seneca Castle, N. Y.; second prize, two dollars.

Onions.

Lewis Groffman, South Syracuse, N. Y.; first prize, three dollars.
Francis Bradt, Jerusalem, N. Y.; second prize, two dollars.

Tomatoes.

Howard Brothers, Irondequoit, N. Y.; first prize, three dollars.
Lewis Groffman, South Syracuse, N. Y.; second prize, two dollars.

Egg Plants.

Howard Brothers, Irondequoit, N. Y.; first prize, three dollars.

Garden Beans.

Myron F. Pierson, Seneca Castle, N. Y.; first prize, three dollars.
Charles N. Tuttle, Clockville, N. Y.; second prize, two dollars.

Peppers.

John Bradt, Bethlehem Centre, N. Y.; first prize, three dollars.
Francis Bradt, Jerusalem, N. Y.; second prize, two dollars.

Squashes.

Myron F. Pierson, Seneca Castle, N. Y.; first prize, three dollars.
Charles N. Tuttle, Clockville, N. Y.; second prize, two dollars.

Pumpkins.

Stryker & Jones, Rome, N. Y.; first prize, three dollars.
G. H. F. Van Horne, Fonda, N. Y.; second prize, two dollars.

Sweet Potatoes.

Howard Brothers, Irondequoit, N. Y.; second prize, two dollars.

Potatoes — Exhibitions of early varieties.

Myron F. Pierson, Seneca Castle, N. Y.; first prize, ten dollars.
Mrs. Seth Bonfoy, West Winfield, N. Y.; second prize, five dollars.

Potatoes — Exhibitions of late varieties.

Myron F. Pierson, Seneca Castle, N. Y.; first prize, ten dollars.
Charles N. Tuttle, Clockville, N. Y.; second prize, five dollars.

Potatoes — Exhibitions of stock-feeding varieties.

Myron F. Pierson, Seneca Castle, N. Y.; first prize, ten dollars.

Collections of Vegetables.

Howard Brothers, Irondequoit, N. Y.; first prize, twenty-five dollars.
George Holtzman, Syracuse, N. Y.; second prize, ten dollars.

BUTTER.

Special Prize for the Best Six Packages, not less than thirty pounds net each, made in the same Creamery or Private Dairy.

Union Creamery, Frankfort Hill, N. Y.; first prize, fifty dollars.

Packages made in June in Creamery.

Risley Brothers, New York Mills, N. Y.; first prize, thirty dollars.

Packages made at any time in Creamery.

Union Creamery, Frankfort Hill, N. Y.; first prize, thirty dollars.
B. F. Petrie, Middleville, N. Y.; second prize, twenty dollars.
Maple Grove Creamery, Laona, N. Y.; third prize, ten dollars.

Packages made in June in Private Dairy.

A. C. Biggar, Pepacton, N. Y.; first prize, thirty dollars.
Morgan Wood & George A. Wood, West Martinsburgh, N. Y.; second prize, twenty dollars.
Wm. F. Ford, West Davenport, N. Y.; third prize, ten dollars.

Packages made at any time in Private Dairy.

A. C. Biggar, Pepacton, N. Y.; first prize, thirty dollars.
J. S. Shattuck, Norwich, N. Y.; second prize, twenty dollars.
Seymour P. Johnson, East Schuyler, N. Y.; third prize, ten dollars.

Molds or Rolls.

Mrs. William Wallace, Sandy Creek, N. Y.; first prize, fifteen dollars.
T. R. Proctor, Utica, N. Y.; second prize, ten dollars.
J. S. Shattuck, Norwich, N. Y.; third prize, five dollars.

CHEESE.

Special Prize for the Best Dozen Cheeses, not less than twenty pounds each, from the same Factory or Dairy, and suitable for army or other use.

S. C. Wheelock, North Winfield, N. Y.; first prize, fifty dollars.

American Cheese, over One Year Old.

R. Bartlett Factory, Winfield, N. Y.; first prize, thirty dollars.
George R. Wright, Whitesboro, N. Y.; second prize, twenty dollars.
Seth Bonfoy, West Winfield, N. Y.; third prize, ten dollars.

American Cheese, less than One Year Old.

White Creek Factory, Herkimer, N. Y.; first prize, thirty dollars.
Samuel Hilton, Flat Creek, N. Y.; second prize, twenty dollars.
Laona Factory, Laona, N. Y.; third prize, ten dollars.

BREAD, SUGAR, ETC.

Wheaten Bread.

Joseph Nunn, Utica, N. Y.; first prize, five dollars.
Mrs. William Wallace, Sandy Creek, N. Y.; second prize, three dollars.

Rye Bread.

Abram Stone, Stanwix, N. Y.; first prize, five dollars.
Mrs. George R. Wright, Whitesboro, N. Y.; second prize, three dollars.

Indian or Rye and Indian Bread.

Mrs. J. A. Henry, Reed's Corners, N. Y.; first prize, five dollars.
Mrs. J. L. Kipp, Hopewell, N. Y.; second prize, three dollars.

Maple Sugar.

Ellis J. Rider, Rodman, N. Y.; first prize, five dollars.
William F. Ford, West Davenport, N. Y.; second prize, three dollars.

Maple Syrup.

William F. Ford, West Davenport, N. Y.; first prize, five dollars.
Mrs. William Wallace, Sandy Creek, N. Y.; second prize, three dollars.

Preserved Fruits.

Abram Stone, Stanwix, N. Y.; first prize, five dollars.
Mrs. William Wallace, Sandy Creek, N. Y.; second prize, three dollars.

Canned Fruits.

Mrs. George R. Wright, Whitesboro, N. Y.; first prize, five dollars.
Abram Stone, Stanwix, N. Y.; second prize, three dollars.

Pickles in Vinegar.

Abram Stone, Stanwix, N. Y.; first prize, five dollars.
George H. Mather, Stanwix, N. Y.; second prize, three dollars.

Dried Apples.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, five dollars.
Mrs. J. L. Kipp, Hopewell, N. Y.; second prize, three dollars.

Dried Peaches.

Mrs. J. A. Henry, Reed's Corners, N. Y.; first prize, five dollars.
Miss L. P. Tennant, Stanwix, N. Y.; second prize, three dollars.

Dried Whortleberries.

Miss L. P. Tennant, Stanwix, N. Y.; first prize, five dollars.

Dried Raspberries.

C. P. Whitney, Orleans, N. Y.; first prize, five dollars.
Mrs. J. A. Henry, Reed's Corners, N. Y.; second prize, three dollars.

BEES AND HONEY.

Comb Honey, made from White Clover or Linden.

Peter Miller, Fredonia, N. Y.; first prize, five dollars.

Extracted Honey, made from White Clover or Linden.

Peter Miller, Fredonia, N. Y.; first prize, five dollars.

FLOWERS.

PROFESSIONAL LIST.

Exhibition of Cut Flowers.

James Vick, Rochester, N. Y.; gold medal.

AMATEUR LIST.

Collections of Cut Flowers.

L. P. Tennant, Stanwix, N. Y.; first prize, ten dollars.
John S. Harmon, Chatham, N. Y.; second prize, five dollars.

Collections of Dahlias.

L. P. Tennant, Stanwix, N. Y.; first prize, six dollars.
George H. Mathers, Stanwix, N. Y.; second prize, three dollars.

Twelve Dahlias.

George H. Mathers, Stanwix, N. Y.; first prize, three dollars.

Six Dahlias.

George H. Mathers, Stanwix, N. Y.; first prize, two dollars.
John S. Harmon, Chatham, N. Y.; second prize, one dollar.

Collections of Verbenas.

George H. Mathers, Stanwix, N. Y.; first prize, five dollars.
Abram Stone, Stanwix, N. Y.; second prize, three dollars.

Twelve Verbenas.

Abram Stone, Stanwix, N. Y.; first prize, three dollars.
George H. Mathers, Stanwix, N. Y.; second prize, two dollars.

Six Verbenas.

George H. Mathers, Stanwix, N. Y.; first prize, two dollars.
Abram Stone, Stanwix, N. Y.; second prize, one dollar.

Collections of Phloxes.

Abram Stone, Stanwix, N. Y.; first prize, five dollars.
George H. Mathers, Stanwix, N. Y.; second prize, three dollars.

Six Phloxes.

L. P. Tennant, Stanwix, N. Y.; first prize, two dollars.

Collections of Asters.

Abram Stone, Stanwix, N. Y.; first prize, three dollars.
George H. Mathers, Stanwix, N. Y.; second prize, two dollars.

Collections of Pansies.

Abram Stone, Stanwix, N. Y.; first prize, three dollars.
George H. Mathers, Stanwix, N. Y.; second prize, two dollars.

Collections of Ten-week Stocks.

Abram Stone, Stanwix, N. Y.; first prize, three dollars.
L. P. Tennant, Stanwix, N. Y.; second prize, two dollars.

Collections of Gladiolus.

D. S. Marvin, Watertown, N. Y.; first prize, three dollars.
E. P. Powell, Clinton, N. Y.; second prize, two dollars.

Twelve Gladiolus.

E. P. Powell, Clinton, N. Y.; first prize, two dollars.

Collections of Everlasting Flowers.

L. P. Tennant, Stanwix, N. Y.; first prize, three dollars.
Miss Mary Coolidge, Phelps, N. Y.; second prize, two dollars.

Collections of Green-house and Stove Plants.

William Matthews, Utica, N. Y.; gold medal.
Charles H. Schiller, Utica, N. Y.; second prize, thirty dollars.

FRUITS.

PROFESSIONAL LIST.

Forty Varieties of Apples.

William Garlock, Canajoharie, N. Y.; first prize, twenty dollars.

Twenty-five Varieties of Pears.

Ellwanger & Barry, Rochester, N. Y.; first prize, twenty dollars.
Washington Garlock, Utica, N. Y.; second prize, ten dollars.

Twenty Varieties of Pears.

Ellwanger & Barry, Rochester, N. Y.; first prize, ten dollars.

Ten Varieties of Pears.

Ellwanger & Barry, Rochester, N. Y.; first prize, five dollars.

Ten Varieties of Plums.

Ellwanger & Barry, Rochester, N. Y.; first prize, five dollars.

Five Varieties of Plums.

Ellwanger & Barry, Rochester, N. Y.; first prize, three dollars.

Single Variety of Plums.

Ellwanger & Barry, Rochester, N. Y.; first prize, two dollars.
D. S. Marvin, Watertown, N. Y.; second prize, one dollar.

Single Variety of Quinces.

Ellwanger & Barry, Rochester, N. Y.; first prize, two dollars.

Ten Varieties of Native Grapes.

Ellwanger & Barry, Rochester, N. Y.; first prize, ten dollars.
Palmer Worden, Fayetteville, N. Y.; second prize, five dollars.

Five Varieties of Native Grapes.

Ellwanger & Barry, Rochester, N. Y.; first prize, five dollars.
Palmer Worden, Fayetteville, N. Y.; second prize, three dollars.

Ten Varieties of Foreign Grapes.

P. Barry, Rochester, N. Y.; first prize, ten dollars.

AMATEUR LIST.

Twenty Varieties of Apples.

Myron F. Pierson, Seneca Castle, N. Y.; first prize, ten dollars.
A. Stisser, Wampsville, N. Y.; second prize, five dollars.

Ten Varieties of Apples.

E. Van Allen, Bethlehem Centre, N. Y.; first prize, five dollars.
A. Stisser, Wampsville, N. Y.; second prize, three dollars.

Five Varieties of Apples.

S. Spencer & Son, Kiantone, N. Y.; first prize, three dollars.
P. C. Van Allen, Slingerlands, N. Y.; second prize, two dollars.

Ten Varieties of Pears.

M. E. Myers, Charlton, N. Y.; first prize, five dollars.

Five Varieties of Pears.

M. E. Myers, Charlton, N. Y.; first prize, three dollars.
S. Spencer & Son, Kiantone, N. Y.; second prize, two dollars.

Three Varieties of Plums.

M. E. Myers, Charlton, N. Y.; first prize, two dollars.

Single Variety of Plums.

M. E. Myers, Charlton, N. Y.; first prize, one dollar.

Quinces.

H. M. Jaques, Wright's Corners, N. Y.; first prize, two dollars.
P. C. Van Allen, Slingerlands, N. Y.; second prize, one dollar.

Ten Varieties of Native Grapes.

H. M. Jaques, Wright's Corners, N. Y.; first prize, six dollars.
E. P. Powell, Clinton, N. Y.; second prize, three dollars.

Five Varieties of Native Grapes.

Monroe Dunham, Bennetsburgh, N. Y.; first prize, three dollars.
E. P. Powell, Clinton, N. Y.; second prize, two dollars.

SINGLE DISHES OF FRUIT, OPEN TO ALL.

APPLES.

Fall Pippins.

W. A. Barns, Kirkland, N. Y.; two dollars.

Gravenstein.

Myron F. Pierson, Seneca Castle, N. Y.; two dollars.

Baldwins.

Myron F. Pierson, Seneca Castle, N. Y.; two dollars.

King of Tompkins County.

Monroe Dunham, Bennetsburgh, N. Y.; two dollars.

Northern Spy.

S. Spencer & Son, Kiantone, N. Y.; two dollars.

Rhode Island Greening.

Monroe Dunham, Bennetsburgh, N. Y.; two dollars.

Roxbury Russet.

S. Spencer & Son, Kiantone, N. Y.; two dollars.

Twenty-ounce.

Monroe Dunham, Bennetsburgh, N. Y.; two dollars.

Esopus Spitzenberg.

Wm. Garlock, Canajoharie, N. Y.; two dollars.

Red Canada.

Myron F. Pierson, Seneca Castle, N. Y.; two dollars.

PEARS.

Bartlett.

Ellwanger & Barry, Rochester, N. Y.; two dollars.

Beurre d'Anjou.

P. Barry, Rochester, N. Y.; two dollars.

Beurre Clairgeau.

Ellwanger & Barry, Rochester, N. Y.; two dollars.

Beurre Bosc.

Ellwanger & Barry, Rochester, N. Y.; two dollars.

Duchess d'Angouleme.

P. Barry, Rochester, N. Y.; two dollars.

Doyenne Boussock.

Ellwanger & Barry, Rochester, N. Y.; two dollars.

Seckel.

E. Van Allen, Bethlehem Centre, N. Y.; two dollars.

Sheldon.

Ellwanger & Barry, Rochester, N. Y.; two dollars.

Lawrence.

P. Barry, Rochester, N. Y.; two dollars.

Winter Nellis.

P. Barry, Rochester, N. Y.; two dollars.

GRAPES.

Concord.

Monroe Dunham, Bennetsburgh, N. Y.; two dollars.

Delaware.

Palmer Worden, Fayetteville, N. Y.; two dollars.

Hartford.

Stephen Treen, East Utica, N. Y.; two dollars.

Isabella.

Monroe Dunham, Bennetsburgh, N. Y.; two dollars.

Any of Rogers' Varieties.

B. Wheaton Clark, Lockport, N. Y.; two dollars.

1883.—*ABSTRACT of Treasurers' Reports of the County Agricultural Societies.*

COUNTIES.	Balance from 1882.	Receipts.	Premiums.	Expenses.	Balance to 1884.	Remarks.
Allegany	$283 79	$1,633 71	$616 75	$1,348 39	$47 64	Purses, $534.54.
Broome	.....	3,535 55	2,185 50	1,350 05	5 70	
Cattaraugus	58 89	1,706 38	1,038 70	740 70	25 87	Purses, $506.50.
Cayuga	145 42	4,967 92	2,347 01	2,819 15	52 82	Purses, $1,269.76.
Chautauqua	291 58	3,080 81	1,949 65	970 87	451 87	
Chemung	.....	.....	.....	.....	.....	Incomplete.
Chenango	.....	.....	.....	.....	.....	Incomplete.
Columbia	1,391 53	2,749 10	1,012 75	1,020 21	2,107 67	Improvements, $334.41; purses, $464.
Cortland	25 50	4,015 48	2,945 00	1,095 98	.....	Improvements, $770.
Delaware	.....	736 85	501 94	391 98	157 07	
Dutchess	.....	4,530 21	1,706 00	2,603 60	220 61	Purses, $658.
Erie	202 06	3,658 44	2,039 90	1,268 08	552 50	Purses, $485; permanent improvements, $674.52.
Essex	19 22	1,531 62	615 03	931 00	4 81	Land, $500; purses, $275.
Franklin	2,170 24	5,523 08	2,561 00	3,401 96	1,730 36	Purses, $1,420.50; permanent improvements, $1,533.50.
Fulton	319 26	9,458 97	3,963 08	5,745 83	69 32	Purses, $1,483.50.
Genesee	.....	2,159 75	1,100 00	781 00	278 75	
Greene	19 79	2,578 81	1,423 50	1,006 78	168 32	
Herkimer	912 76	2,341 47	1,497 25	1,221 80	535 18	
Jefferson	210 94	4,272 68	1,806 25	1,951 85	725 52	Permanent improvements, $727.25.
Lewis	16 76	3,343 80	974 50	2,376 97	9 09	
Livingston	881 45	2,034 11	889 00	1,559 81	466 75	
Monroe	20 47	9,746 54	2,512 61	7,154 56	99 84	Permanent improvements, $2,724.67.
Montgomery	439 43	2,687 94	1,597 22	1,444 99	85 16	Purses, $439.43.
New York, American Inst.	26,555 50	44,472 64	1,764 50	31,977 41	37,286 23	
Niagara	80 78	3,557 95	1,986 38	1,352 41	299 44	
Oneida	270 18	4,237 61	1,934 25	2,232 34	341 20	Purses, $693.20.
Onondaga	3,803 83	10,611 12	2,703 00	9,391 02	2,320 93	Includes dividends, $4,006.
Ontario	.....	3,368 63	1,562 30	1,215 17	591 16	Permanent improvements, $250.
Orange	1,638 21	7,092 39	2,529 00	3,532 45	2,669 15	
Orleans	1,263 26	1,679 44	1,313 25	2,630 45	805 50	Permanent improvements, $713.84.
Oswego	.....	3,454 96	1,199 96	2,225 00	.....	Permanent improvem'ts, grand stand, etc., $1,034.15.
Otsego	70 11	3,142 44	1,096 79	1,491 23	24 53	Purses, $455.16.
Putnam	102 57	1,773 18	707 75	1,038 37	129 63	
Queens	352 37	12,121 59	5,851 75	4,903 25	1,718 96	
Rensselaer	1,167 65	2,793 25	962 00	1,444 26	1,555 64	Purses, $320.50.
Rockland	28 05	703 70	460 60	248 60	22 50	
St. Lawrence	Old debt to sink'g fund.	5,118 14	2,961 25	1,658 13	498 76	Purses, $1,520; permanent improvements, $232.21.
Saratoga	34 12	3,636 40	844 45	2,719 70	106 37	
Schenectady	.....	1,143 15	252 50	409 97	480 68	

Schoharie	198 84	6,188 54	5,303 50	4,896 81	387 07	Purses, $650.
Schuyler	.....	.....	.....	.....	.....	Incomplete.
Seneca	844 26	7,266 04	788 73	6,828 97	492 60	Permanent improvements, $4,688.18.
Steuben	504 17	4,552 82	1,987 00	2,736 69	333 30	
Suffolk	4 47	2,830 51	854 50	1,145 87	834 61	
Sullivan	332 52	1,184 79	662 70	668 13	86 48	Permanent improvements, $300.
Tioga	107 47	1,181 19	831 66	506 20	49 20	
Tompkins	33 66	5,808 11	1,678 50	4,163 27	7 83	Permanent improvements, $1,322.34.
Ulster	.....	.....	.....	.....	.....	No fair.
Warren	774 64	2,575 00	1,245 25	1,615 17	489 41	
Washington	1,169 67	4,948 51	1,867 00	1,797 61	114 23	
Wayne	95	1,401 54	546 50	805 63	50 36	
Wyoming	1 81	1,055 54	325 00	415 10	317 25	
Yates	4 09	1,418 74	582 15	825 62	15 06	

Madison County Town Societies.

Brookfield	$361 46	$1,269 32	$778 05	$627 02	.....	
Lenox	.....	2,599 37	787 51	1,769 11	$42 75	Purses, $327.50; permanent improvements, $700.

Indian Agricultural Societies.

Allegany	.....	$230 00	$105 85	$250 00	$125 85	
Red House						
Cattaraugus	.....	824 51	509 80	435 26	130 55	
Iroquois						
Onondaga	.....	391 66	243 00	148 66	.....	Purses, $108.

Full face figures denote debit balances.

1884.—*ABSTRACT of Treasurers' Reports of the County Agricultural Societies.*

COUNTIES.	Balance from 1883.	Receipts.	Premiums.	Expenses.	Balance to 1885.	Remarks.
Allegany	$275 94	$1,371 39	$1,015 00	$1,535 23	$902 90	Races, $426.
Broome	325 82	3,795 01	1,658 25	1,552 11	258 83	Permanent improvement, $350.
Cattaraugus	25 85	1,825 22	832 88	856 19	162 01	Races, $252.50.
Cayuga	.....	3,730 21	1,605 00	1,543 18	582 03	Races, $725.
Chautauqua	.....	.....	.....	.....	.....	Not received.
Chemung	.....	.....	.....	.....	.....	No fair. State fair at Elmira.
Chenango	495 96	1,934 76	1,308 24	494 75	627 73	Races, $313.
Columbia	2,107 67	2,758 02	1,375 75	3,461 00	29 34	Races, $687.50; permanent improvement, $1,676.03.
Cortland	.....	1,277 44	602 00	557 44	118 00	
Delaware	.....	1,160 50	396 01	764 09	.....	
Dutchess	398 20	3,889 18	1,679 00	1,900 85	707 53	
Erie	870 00	6,365 40	2,293 05	5,129 89	77 54	Races, $533; permanent improvement, $3,034.35.
Essex	4 81	1,662 84	632 57	1,031 83	2 65	Races, $240; permanent improvement, $643.56.
Franklin	1,730 36	5,951 63	3,483 51	3,333 46	865 02	Races, $2,332.51; permanent improvement, $2,153.84.
Fulton	69 32	8,612 03	3,621 73	4,968 73	90 87	Races, $1,907.50; note and interest, $1,557.
Genesee	181 86	2,794 65	1,340 29	1,431 06	205 16	Races, $549.50.
Greene	168 32	2,489 06	1,288 45	1,257 40	111 53	
Herkimer	535 18	3,007 15	1,857 25	1,164 53	520 55	
Jefferson	725 52	3,824 04	1,905 87	2,223 95	419 74	Races, $490; permanent improvement, $633.41.
Lewis	9 09	4,588 06	1,359 98	2,402 11	835 06	
Livingston	466 75	2,679 04	1,089 00	927 82	126 98	
Monroe	99 84	5,373 42	2,189 50	2,894 72	389 04	
Montgomery	85 16	3,910 75	1,837 70	1,628 51	529 70	Races, $964.
New York, Am. Inst	37,286 23	35,154 85	2,099 06	32,198 08	40,243 00	
Niagara	299 44	3,647 22	1,708 70	1,783 98	453 90	Races, $820.
Oneida	341 20	4,209 21	1,890 00	2,339 31	321 08	Races, $640; old debt, $1,006.
Onondaga	2,320 93	11,249 35	2,640 00	10,622 69	307 59	Permanent improvement, $1,827.62; dividends, $2,006.
Ontario	591 16	2,726 95	1,755 50	1,062 37	500 24	
Orange	3,129 96	7,125 64	2,643 50	3,592 21	4,019 39	
Orleans	805 50	2,430 74	1,012 80	1,204 59	1,018 85	
Oswego	10 80	2,577 26	1,068 00	1,530 06	.....	Races, $330.
Otsego	24 53	5,563 92	2,221 38	3,315 38	51 69	Races, $610; permanent improvement, $1,359.88.
Putnam	235 02	2,004 85	1,117 35	1,070 43	52 09	
Queens	1,718 96	13,350 51	5,885 50	6,725 42	2,458 05	
Rensselaer	1,555 69	3,537 39	1,309 00	3,599 97	184 11	Races, $312.50; lease of grounds, $1,555.69.
Rockland	22 55	510 12	170 20	335 21	27 26	
St. Lawrence	*	6,137 83	2,662 25	2,322 39	157 19	Races, $1,516; permanent improvement, $1,964.83.
Saratoga	.....	3,975 11	1,760 66	2,174 19	31 26	Races, $694.25.
Schenectady	480 68	1,022 38	1,236 49	689 79	276 68	
Schoharie	387 07	3,342 18	1,417 75	1,811 18	500 31	Races, $766.25; old debt, $1,184.15.

Schuyler	.....	.....	.....	.....	.....	Not received.
Seneca	492 60	2,478 30	840 50	1,785 35	280 45	Permanent improvement and interest on debt, $1,145.
Steuben	333 30	4,672 52	1,916 25	3,089 57	.....	Permanent improvement, $1,272.94.
Suffolk	782 86	3,671 62	1,158 21	2,772 18	524 09	Permanent improvement, $1,800.
Sullivan	86 48	1,167 76	682 45	406 89	164 90	
Tioga	49 20	1,350 94	858 94	466 25	24 75	
Tompkins	7 83	6,388 92	1,560 00	4,786 37	49 42	Permanent improvement, $1,600; old debt, $736.65.
Warren	489 41	2,932 43	1,008 50	1,936 88	476 46	
Washington	114 23	6,588 36	2,014 25	4,617 56	70 78	Old debt, $1,200.
Wayne	50 36	982 04	553 00	467 25	11 93	
Wyoming	.....	.....	.....	.....	.....	No fair.
Yates	112 81	1,576 82	788 50	712 25	188 78	Races, $308.25.

Madison County Town Societies.

Brookfield	.....	$1,549 97	$625 17	$816 58	$108 27	
Lenox	.....	.....	.....	.....	.....	

Indian Agricultural Societies.

Red House, Allegany	.....	$342 50	$109 60	$379 20	$146 30	
Iroquois, Cattaraugus	.....	.....	.....	.....	.....	
Onondaga	.....	225 00	130 00	255 00	160 00	

*Old balance to sinking fund.

1885.—*ABSTRACT of Treasurers' Reports of the County Agricultural Societies.*

COUNTIES.	Balance from 1884.	Receipts.	Premiums.	Expenses.*	Balance to 1886.	Remarks.
Allegany	$903 90	$1,129 60	$487 07	$614 70	$27 83	
Broome	258 83	3,573 92	2,182 75	1,823 76	173 76	
Cattaraugus	162 01	992 38	550 00	589 00	15 39	Races, $260; debt and permanent improvement, $105.
Cayuga	582 03	5,760 69	1,790 50	4,238 43	313 79	Races, $651.20; improvements, $767.97; interest, $279.50.
Chautauqua	.....	.....	.....	.....	.....	No report received.
Chemung	6 11	2,157 76	588 25	1,482 60	93 02	
Chenango	627 73	1,238 35	818 55	1,036 61	10 92	Races, $332.
Columbia	.....	.....	.....	.....	.....	Report incorrect.
Cortland	43 60	2,960 49	231 97	2,722 01	50 11	Races, $1,594; improvements, $597.29.
Delaware	6 75	1,052 64	524 91	534 48	.....	
Dutchess	.....	.....	.....	.....	.....	Report incorrect.
Erie	.....	.....	.....	.....	.....	Report incorrect.
Essex	2 65	1,815 96	525 48	1,102 93	190 20	Races, $340.
Franklin	.....	.....	.....	.....	.....	No report received.
Fulton	90 67	11,358 74	1,540 00	9,679 79	229 62	Races, $1,772.
Genesee	.....	.....	.....	.....	.....	No report received.
Greene	111 53	2,399 98	1,277 65	1,116 00	116 94	
Herkimer	.....	.....	.....	.....	.....	No report received.
Jefferson	419 74	5,461 18	1,834 40	3,068 15	978 32	Races, $905; improvements, $347.85; debt, $290.
Lewis	835 06	3,891 16	1,276 50	2,482 81	966 91	Improvements, $361.89; interest, $162.50.
Livingston	128 98	2,101 44	1,208 00	938 94	83 48	
Monroe	†677 78	4,906 67	1,659 50	3,378 60	546 35	Races, $113; debt and interest, $860.90.
Montgomery	529 70	2,445 10	704 95	2,065 26	204 59	Interest, $200.
New York, Am. Inst.	40,243 00	35,749 44	2,477 68	40,315 71	33,199 05	
Niagara	453 98	3,085 12	896 75	2,642 35	.....	Debt and interest, $805.99; races, $605.
Oneida	321 08	9,395 10	1,322 75	8,239 55	.....	Races, $1,046; debt, $5,200.
Onondaga	.....	.....	.....	.....	.....	Report incorrect.
Ontario	†516 30	2,293 22	1,536 15	1,118 83	154 54	
Orange	.....	.....	.....	.....	.....	Report incorrect.
Orleans	.....	.....	.....	.....	.....	No report received.
Oswego	.....	2,852 72	881 90	1,916 13	54 69	Races, $761.38.
Otsego	51 59	5,561 39	1,899 85	3,606 47	106 63	
Putnam	52 09	2,794 71	1,352 00	1,436 27	58 53	
Queens	2,468 06	14,896 15	7,779 33	7,000 38	2,574 49	
Rensselaer	184 11	.....	.....	.....	184 11	No fair held; State fair at Albany.
Rockland	27 26	549 20	339 31	235 06	2 09	
St. Lawrence	157 19	5,320 18	1,240 43	4,491 15	354 26	Races, $1,745; improvements, $517.76.
Saratoga	31 26	3,652 28	1,088 21	2,836 27	190 94	Races, $895.
Schenectady	276 68	397 08	290 50	357 18	26 08	
Schoharie	500 91	3,376 93	597 50	3,062 42	217 34	Bank failure, $400; debt and interest, $1,314.

Schuyler	535 00	931 67	444 18	643 58	378 91	Races, $50.
Seneca	280 45	3,136 48	1,286 00	1,853 74	277 19	Debt and interest, $306.
Steuben	.....	8,725 85	2,070 50	6,500 98	154 37	Improvements, $4,165.34; debt and interest, $768.22.
Suffolk	524 09	3,316 64	1,193 00	3,276 86	629 13	
Sullivan	164 90	1,058 08	724 63	522 48	24 13	
Tioga	†25 75	1,519 89	787 40	506 99	251 25	
Tompkins	49 42	4,664 36	1,639 00	3,026 66	48 12	Improvements, $1,150.70.
Warren	526 63	2,893 25	942 50	1,956 96	520 42	Races, $700.
Washington	70 78	5,345 91	2,572 50	1,771 15	73 04	
Wayne	11 93	1,371 93	363 75	918 62	101 49	
Wyoming	.....	.....	.....	.....	.....	No report received.
Yates	188 78	1,261 35	218 11	1,240 51	8 49	Races, $109.50; interest, $773.40.

Indian Agricultural Societies.

Red House	.....	114 25	21 25	93 00	.....	
Onondaga	.....	343 66	140 00	203 00	66	

* The amount paid for races and permanent improvements, interest, and on debt, are included in item of expenses.
† Balances corrected since last report.
Full face figures denote debit balances.

1886.— *ABSTRACT of Treasurers' Reports of the County Agricultural Societies.*

COUNTIES.	Balance from 1885.	Receipts.	Premiums.	Expenses.*	Balance to 1887.	Remarks.
Allegany	$27 83	$1,401 47	$389 55	$1,163 42	$138 10	$382, races.
Broome	173 76	4,333 21	2,134 65	2,083 18	115 38	
Cattaraugus	15 39	1,525 08	313 25	1,182 84	44 38	$360, races.
Cayuga	313 79	4,233 38	887 75	2,881 58	677 84	$1,220, debts; $485, races.
Chautauqua	6 00	4,012 52	1,533 00	2,403 11	82 41	$700, rent paid.
Chemung	93 02	2,630 61	1,248 69	1,369 50	105 44	
Chenango	10 92	.....	.....	.....	.....	
Clinton	†..	23,346 74	1,770 00	17,689 18	3,887 56	$16,368.53, for land and buildings.
Columbia	675 94	2,542 56	773 24	1,352 76	1,092 50	$595, races; $224, interest.
Cortland	50 11	4,226 44	1,028 20	2,968 55	279 80	$1,870, races; $864, debts and improvements.
Delaware	23 97	1,131 22	718 37	367 95	68 87	
Dutchess	919 53	4,121 80	1,519 75	3,028 98	492 60	$821.76, debts.
Erie	306 14	6,256 08	2,032 50	4,799 42	369 70	$315, races; $2,756.30, debts and improvements.
Essex	190 20	2,198 12	453 57	1,735 18	199 57	$500, improvements; $300, races.
Franklin	146 20	6,275 43	1,344 00	5,154 81	77 18	$1,056.97, improvements.
Fulton	229 62	6,553 09	1,453 00	5,140 10	189 61	$215, races.
Genesee	.....	3,050 06	881 16	1,780 50	388 40	
Greene	116 94	2,271 26	1,191 79	181 25	5 16	$569.50, races.
Herkimer	917 55	2,379 48	1,887 25	1,338 29	71 49	
Jefferson	978 32	10,119 98	1,469 96	9,388 93	239 41	$1,227.50, races; $4,887.31, improvements.
Lewis	966 91	3,569 76	1,150 90	2,399 79	985 98	
Livingston	83 48	2,529 25	1,417 25	925 87	242 61	
Madison	382 29	1,872 92	706 10	1,156 56	10 26	$916, improvements.
Monroe	546 35	5,551 16	1,811 00	4,112 51	174 00	$1,853.40, improvements.
Montgomery	‡464 10	2,977 81	8 00	2,182 95	1,250 96	$540, races.
New York Am. Institute	33,199 05	56,310 58	2,046 79	64,001 36	23,459 48	
Niagara	38 44	4,463 05	1,073 20	3,488 23	98 38	
Oneida	153 88	4,870 73	1,380 00	3,372 95	271 66	$550, debts; $815, races.
Onondaga	955 08	13,552 96	3,569 50	8,691 48	2,247 06	
Ontario	154 54	2,930 26	2,006 05	1,065 43	13 32	
Orange	5,944 95	8,256 61	3,469 50	4,900 03	5,832 03	$300, rent.
Orleans	944 29	3,849 80	1,222 12	3,415 94	196 03	$1,463, permanent improvement.
Oswego	54 60	1,919 60	713 00	1,264 13	3 84	
Otsego	106 63	2,668 98	1,883 00	870 27	72 34	$132.16, interest.
Putnam	58 53	2,281 63	1,083 25	922 36	276 02	
Queens	2,574 49	16,212 01	8,534 00	8,686 34	1,606 16	
Rensselaer	184 11	2,924 15	936 75	1,940 55	46 85	$138.25 for races.
Rockland	2 00	585 42	318 47	244 19	24 85	
St. Lawrence	254 26	4,199 78	1,203 75	2,904 63	1 85	$500, races; $390, interest.
Saratoga	190 94	4,485 48	1,489 28	2,870 98	125 22	$700, races.

Schenectady	26 08	489 16	211 66	258 34	25 24	$120, debts.
Schoharie	217 34	3,068 27	1,622 00	1,234 99	429 32	$745, interest and debts; $920, races.
Schuyler	378 91	1,122 29	458 26	981 83	101 12	$100, races.
Seneca	277 19	3,354 34	1,119 51	1,990 50	521 52	$907.55, interest and debts.
Steuben	154 37	4,872 31	2,300 70	2,419 77	315 21	$315, interest.
Suffolk	629 13	3,986 43	1,192 00	2,770 31	24 12	$301.36, improvements.
Sullivan	16 96	996 67	587 75	351 23	63 65	
Tioga	251 26	1,907 39	1,129 45	854 45	174 74	
Tompkins	48 12	6,273 29	1,181 25	4,947 16	193 00	$1,778.10, debts.
Warren	520 42	2,599 13	1,121 75	1,596 72	401 08	$486.25, races.
Wayne	101 49	3,159 53	518 25	1,611 95	1,130 82	
Westchester	†.....	9,423 70	748 25	7,997 02	678 43	$3,011.25, races.
Wyoming	67 94	2,785 70	1,519 50	1,331 64	2 50	Premiums paid include 1883 deficit.
Yates	8 49	1,570 77	500 50	879 07	191 20	$434, improvements.

* Expense account includes debts, improvements, land purchased and racing purses.
† Organized within the year.
‡ Corrected since last report.
Heavy-faced figures denote debit balances.

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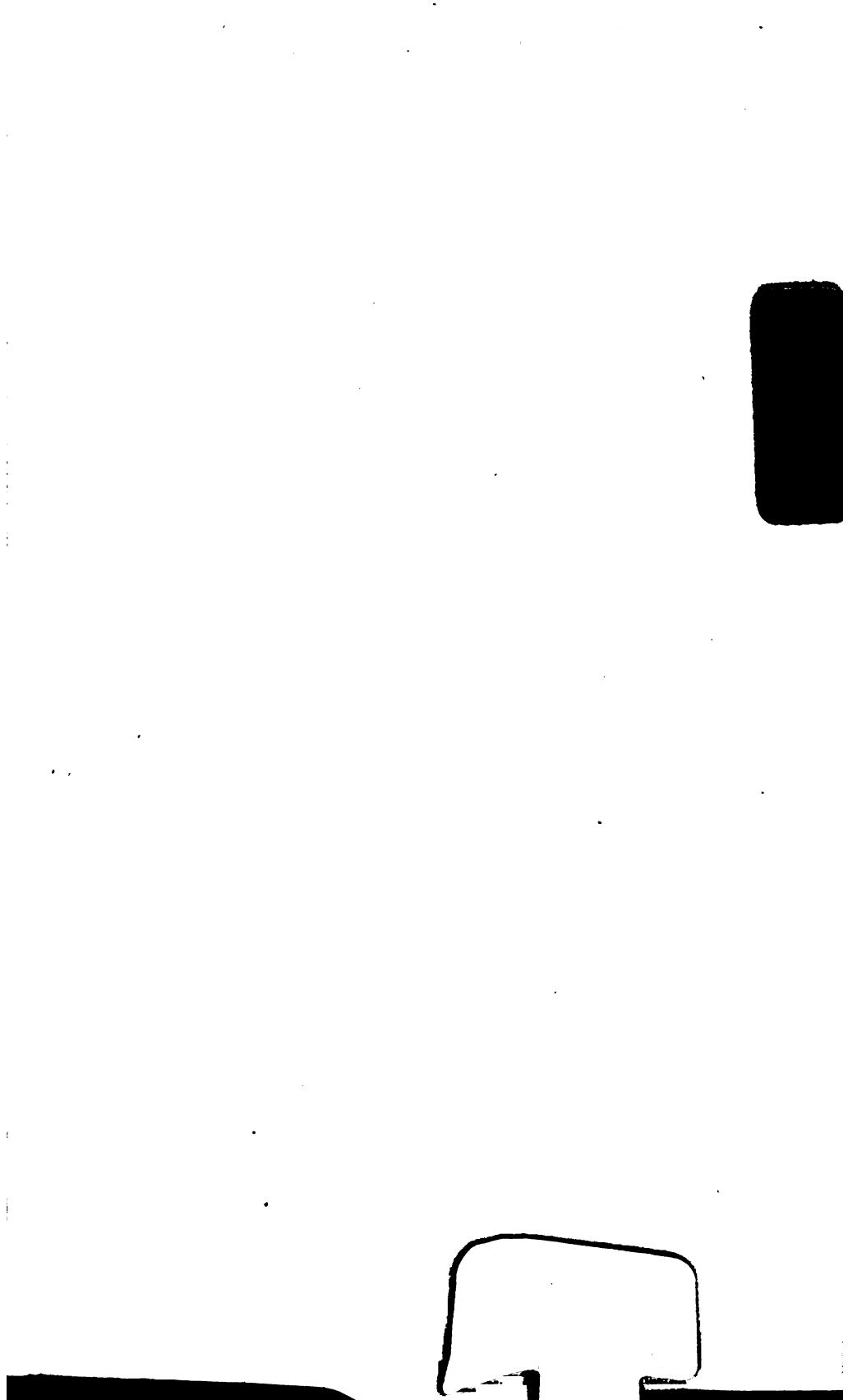
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